VIW-5600D

SERVICE MANUAL

SERVICE ARCHIV
NIEDERLASSUNG HANNOVER

SUPPLEMENT-1

Subject:
4. Block Diagram
6. Self-Diagnostics
8. Adjustment
- **Videodisc Player Section Information**

File this supplement with the service manual.

Refer to the "NEW TECHNICAL THEORY FOR SERVICING" (9-972-918-21) for 3. THEORY OF OPERATION and 7. TROUBLESHOOTING.

MICROFILM

Sony VIEW System

SONY®

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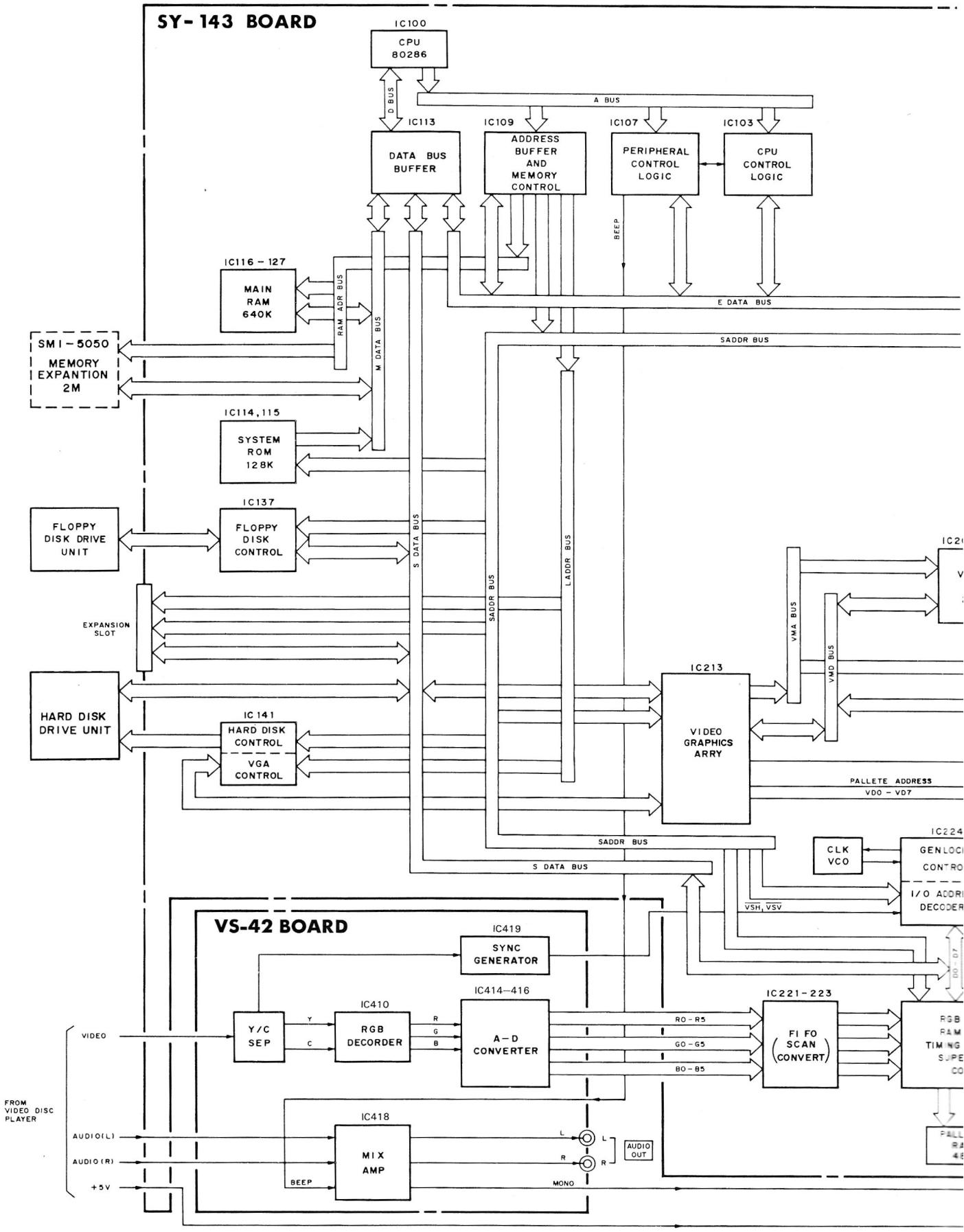
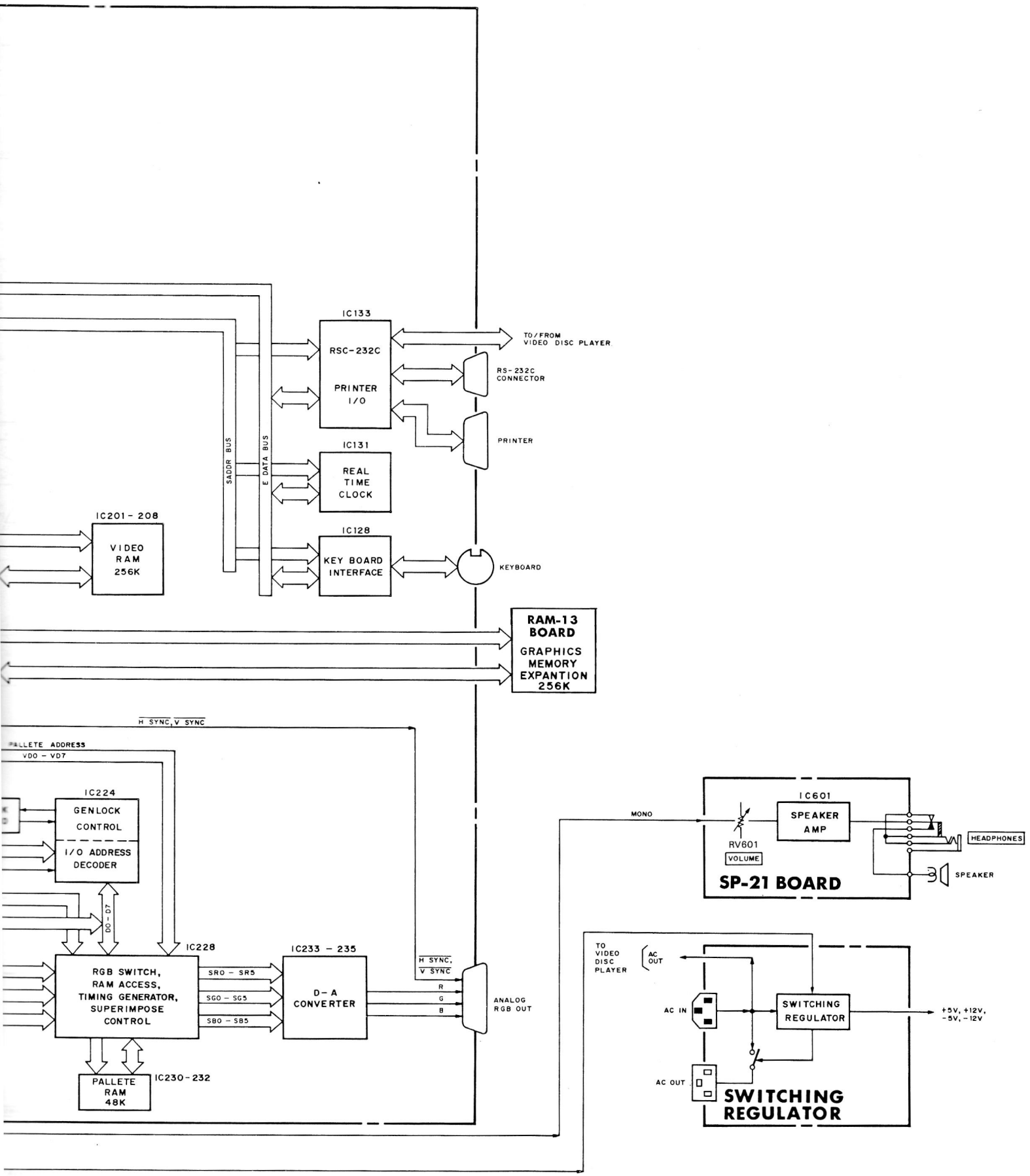
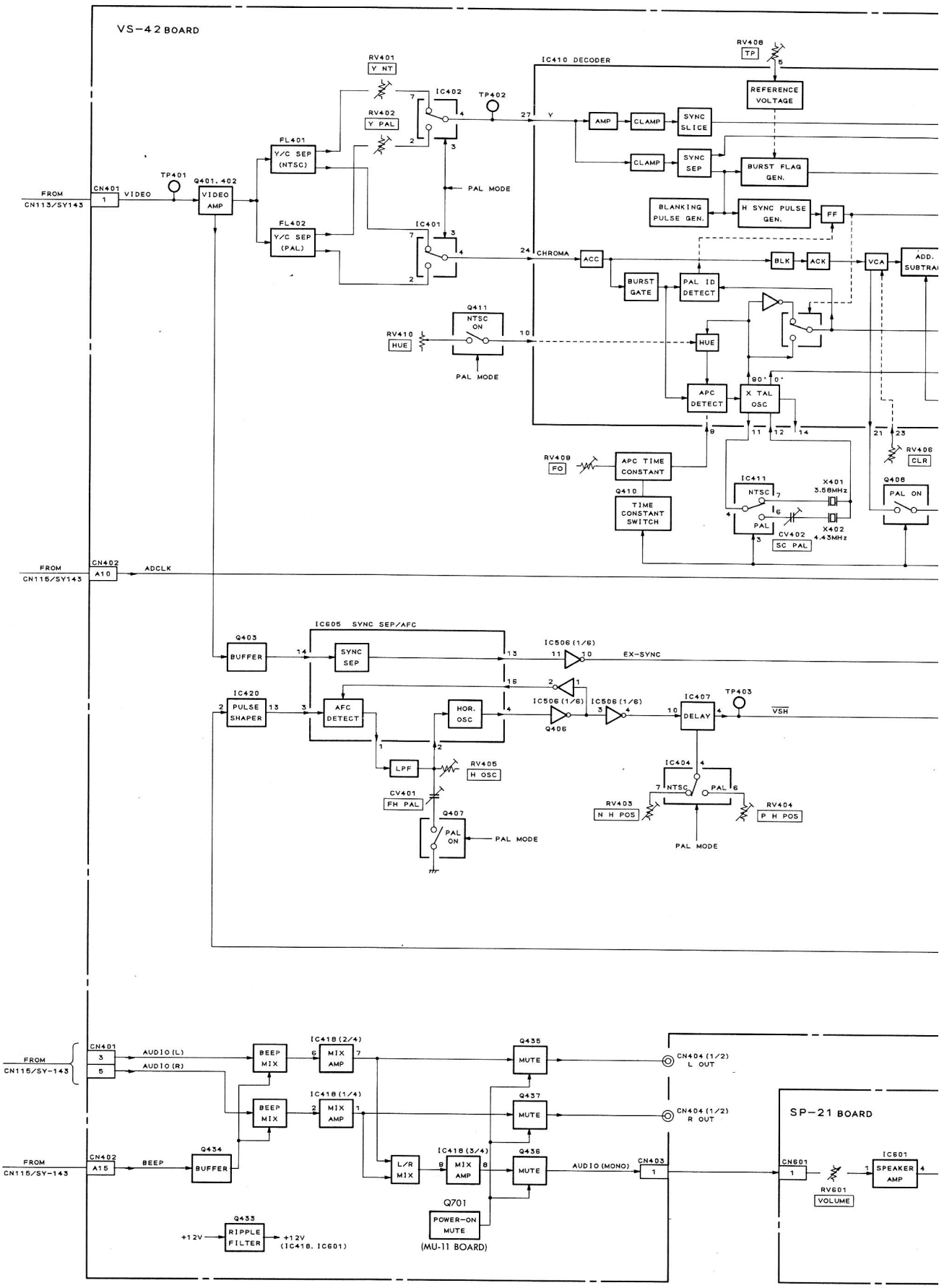
CHAPTER 4
BLOCK DIAGRAM

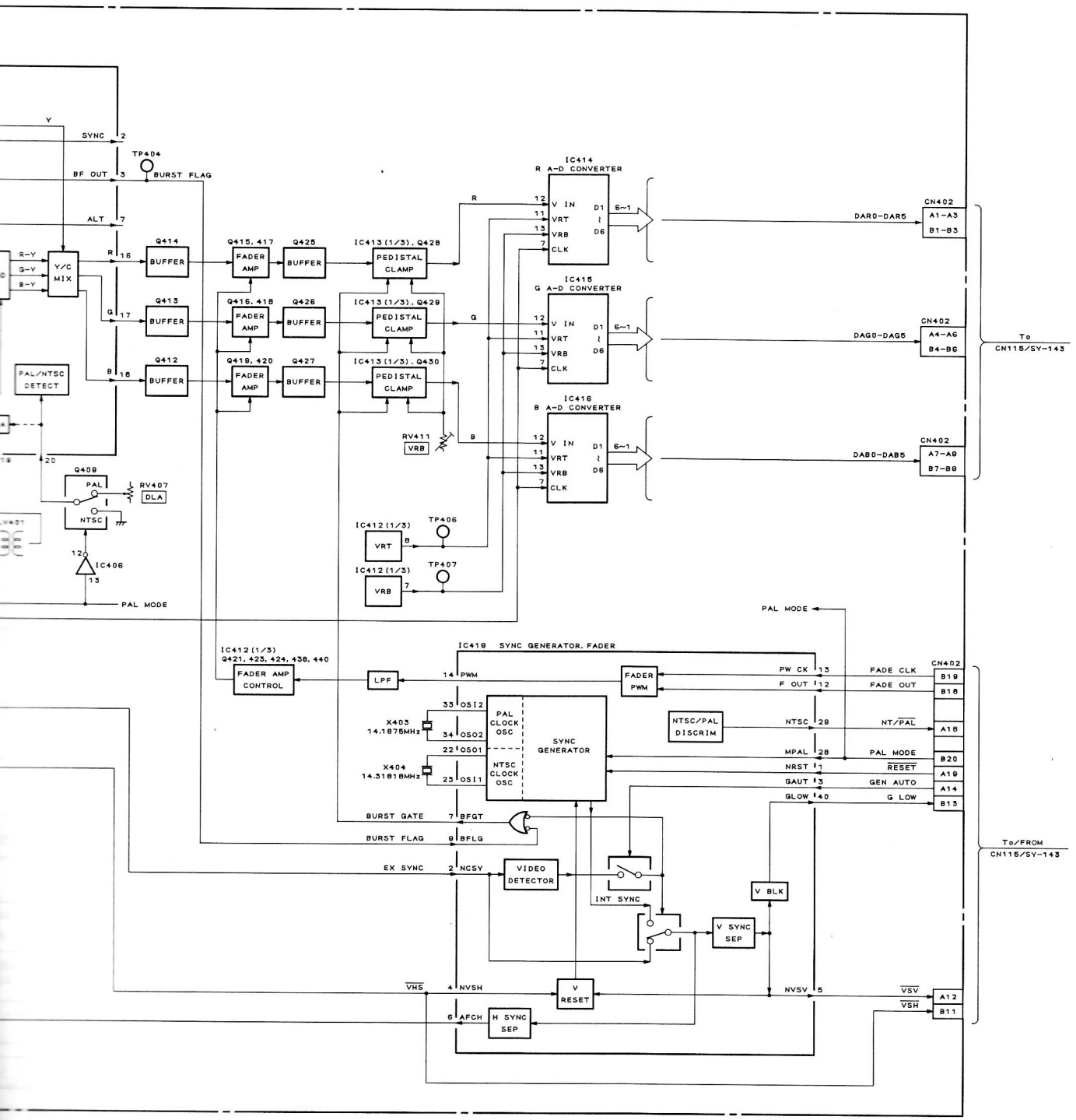
4-1. COMPUTER OUTLINE




IC133
RSC-232C
PRINTER I/O
TO/FROM VIDEO DISC PLAYER
RS-232C CONNECTOR
PRINTER
IC131
REAL TIME CLOCK
IC128
KEY BOARD INTERFACE
KEYBOARD
SADDR BUS
E DATA BUS
IC201 - 208
VIDEO RAM 256K
RAM-13 BOARD
GRAPHICS MEMORY EXPANTION 256K
H SYNC, V SYNC
PALLETE ADDRESS
VD0 - VD7
IC224
GENLOCK CONTROL
I/O ADDRESS DECODER
D0 - D7
IC228
RGB SWITCH, RAM ACCESS, TIMING GENERATOR, SUPERIMPOSE CONTROL
SR0 - SR5
SG0 - SG5
SB0 - SB5
IC233 - 235
D-A CONVERTER
H SYNC, V SYNC
R
G
B
ANALOG RGB OUT
PALLETE RAM 48K
IC230-232
MONO
IC601
SPEAKER AMP
RV601
VOLUME
HEADPHONES
SPEAKER
SP-21 BOARD
TO VIDEO DISC PLAYER
AC OUT
AC IN
SWITCHING REGULATOR
+5V, +12V, -5V, -12V
AC OUT
SWITCHING REGULATOR

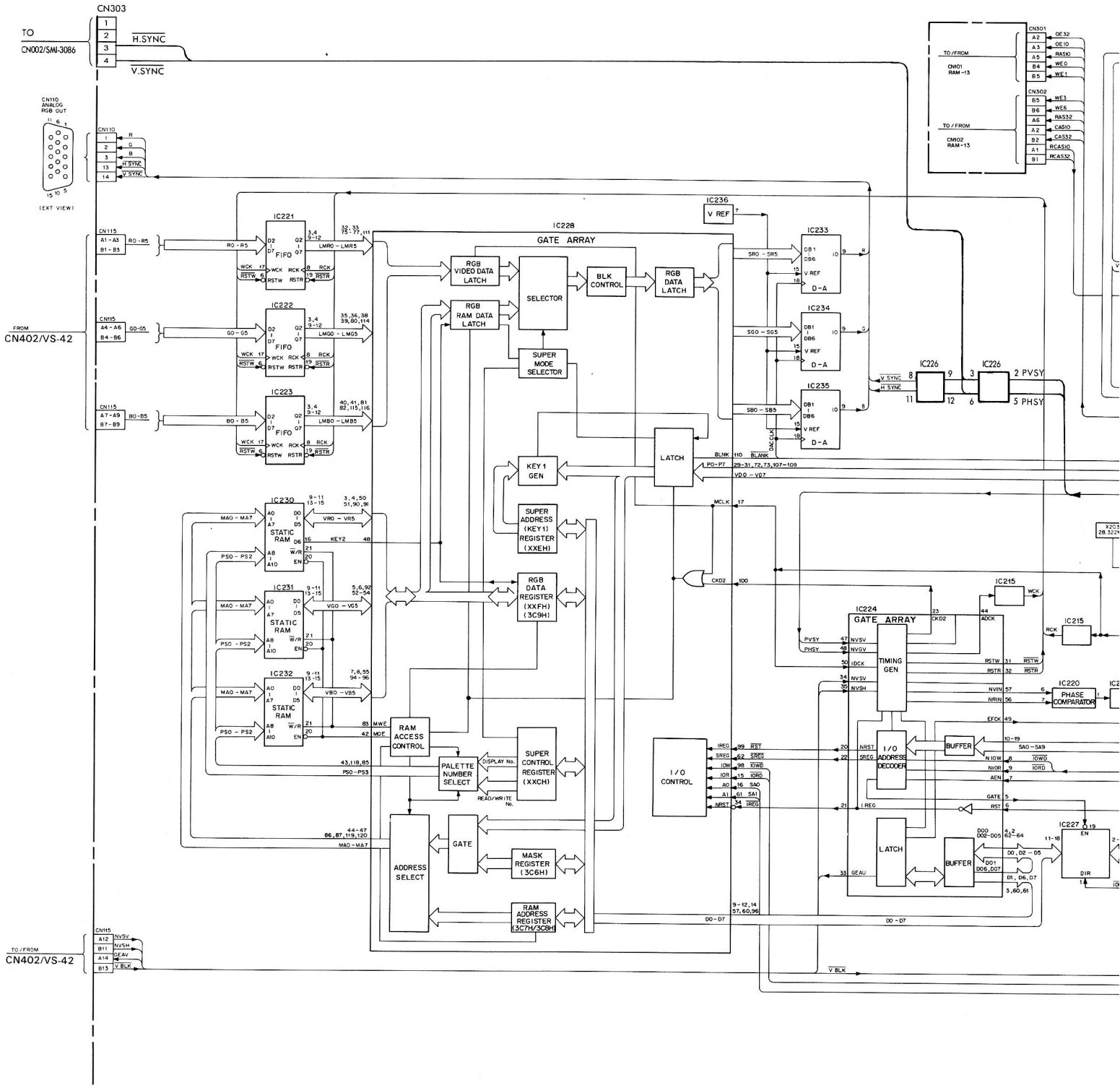
4-2. VS-42, SP-21 BOARDS

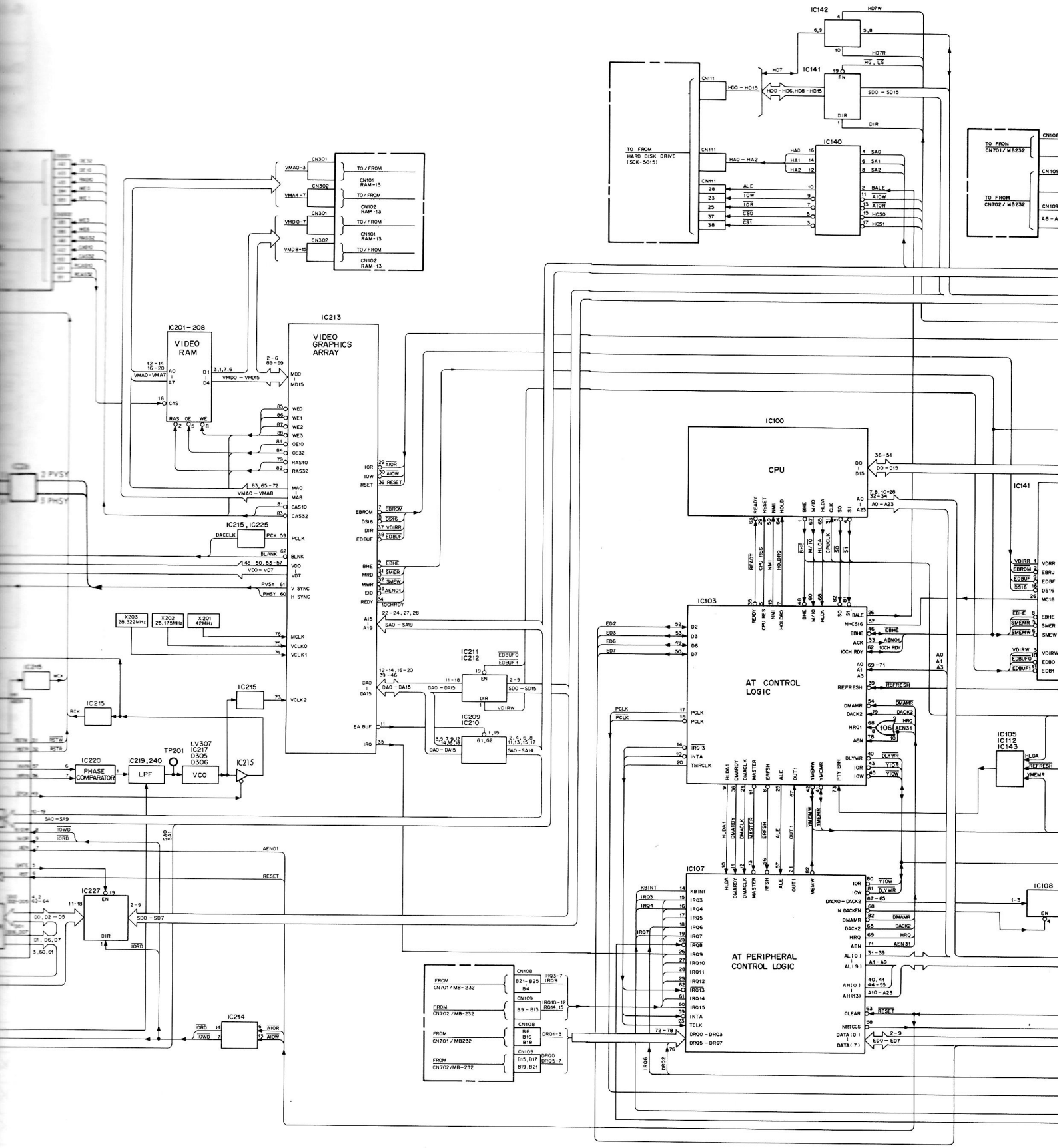


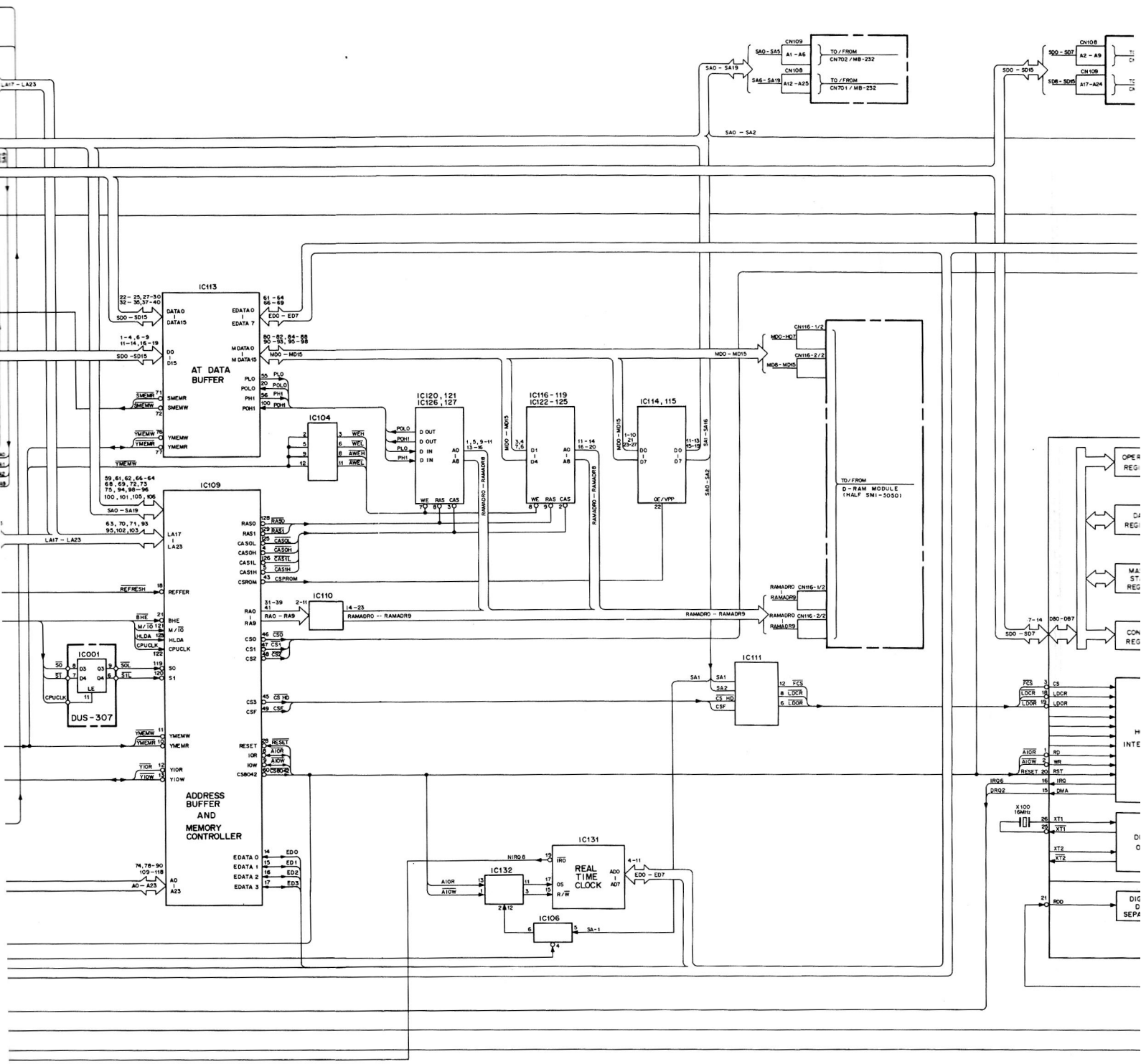


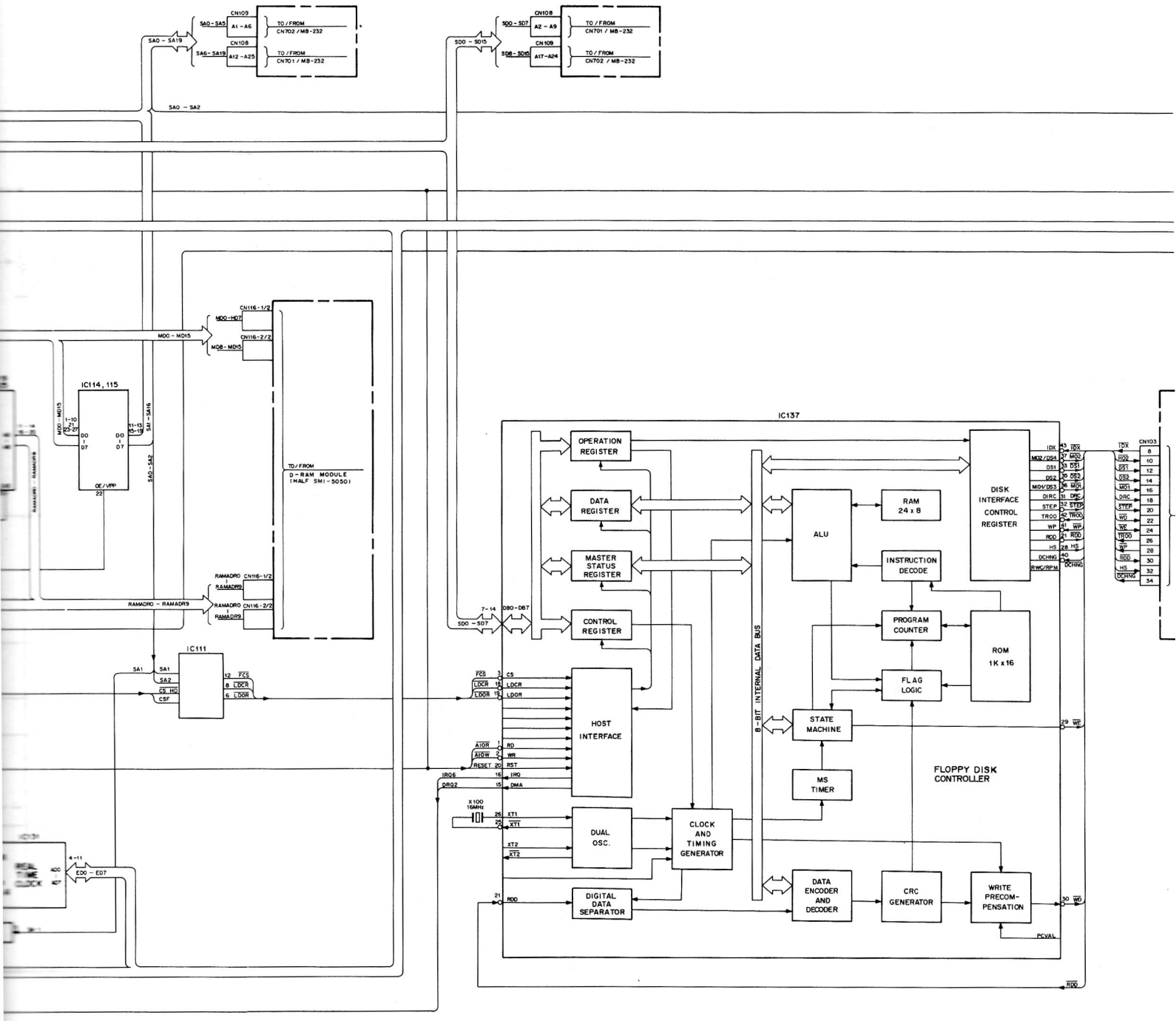
VIW-5600D
VS-42, SP-21

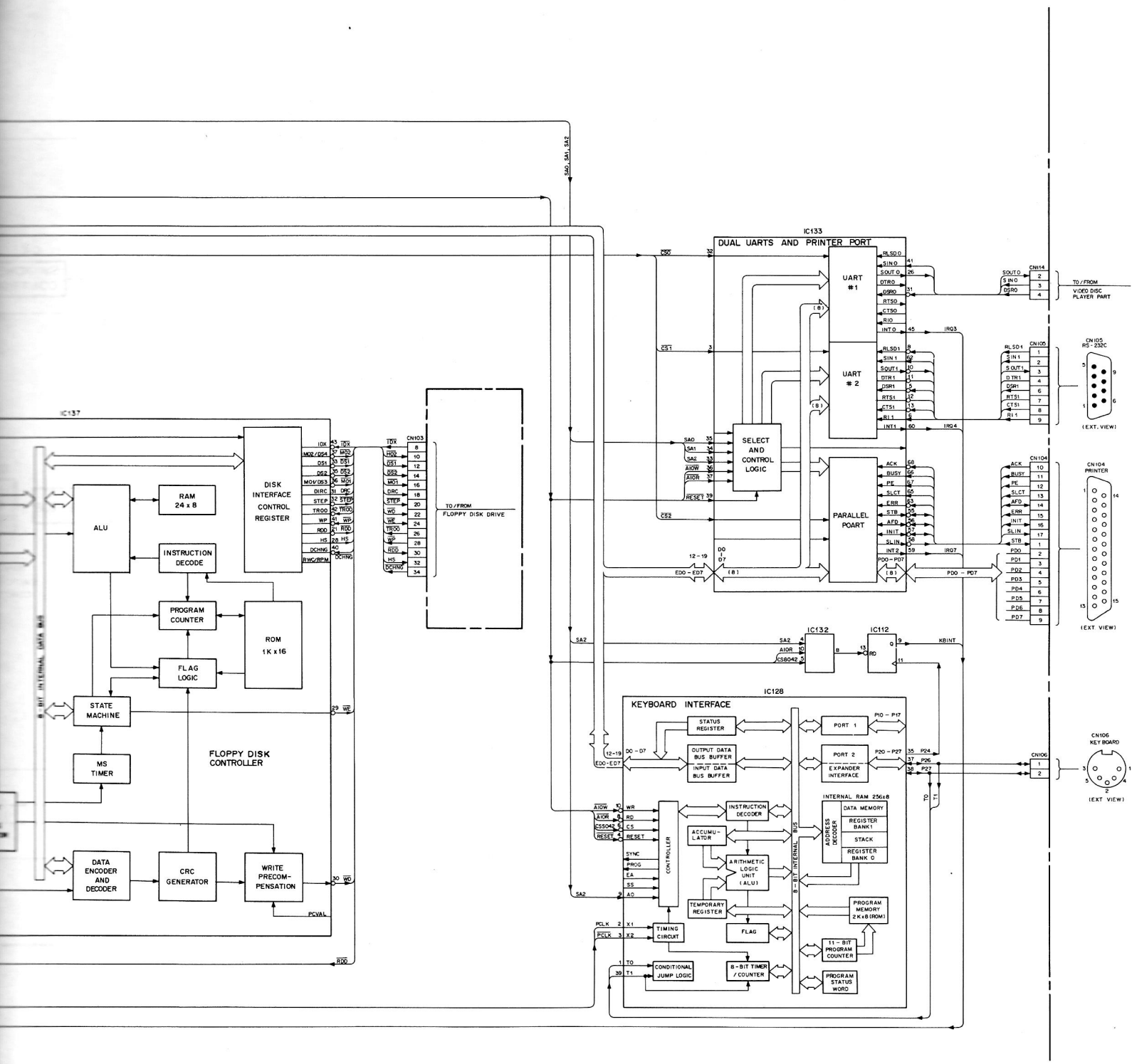
4-3. SY-143 BOARD



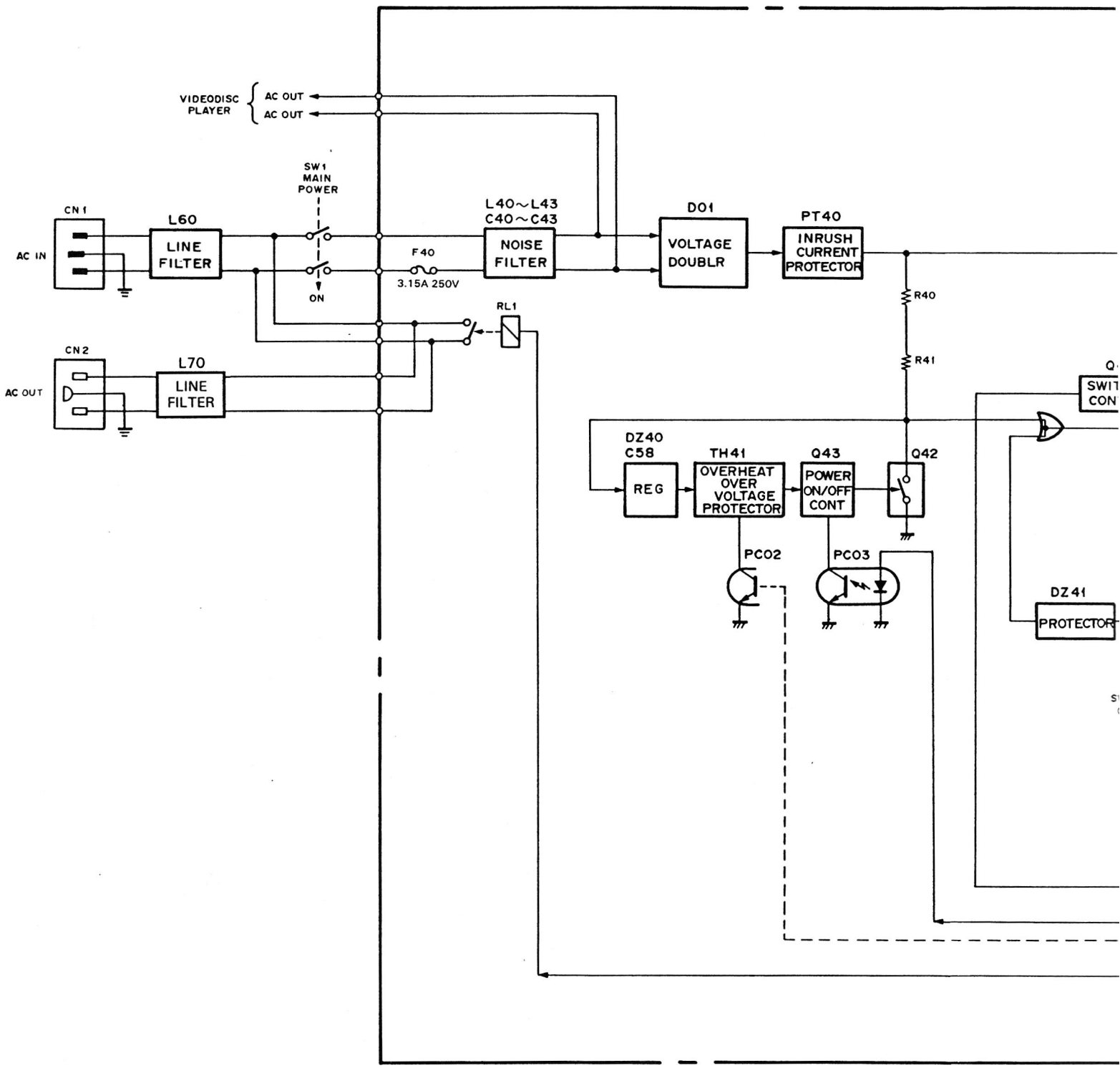

IC142
IC141
IC140
IC100
CPU
IC103
AT CONTROL LOGIC
IC107
AT PERIPHERAL CONTROL LOGIC
IC213
VIDEO GRAPHICS ARRAY
IC201-208
VIDEO RAM
IC215, IC225
IC211
IC212
IC209
IC210
IC220
PHASE COMPARATOR
IC219,240
LPF
VCO
TP201
LV307
IC217
D305
D306
IC227
IC214
IC105
IC112
IC143
IC108
TO FROM HARD DISK DRIVE (SCK-SD15)
TO FROM CN701/MB232
TO FROM CN702/MB232
X203 28.322MHz
X202 25.175MHz
X201 42MHz

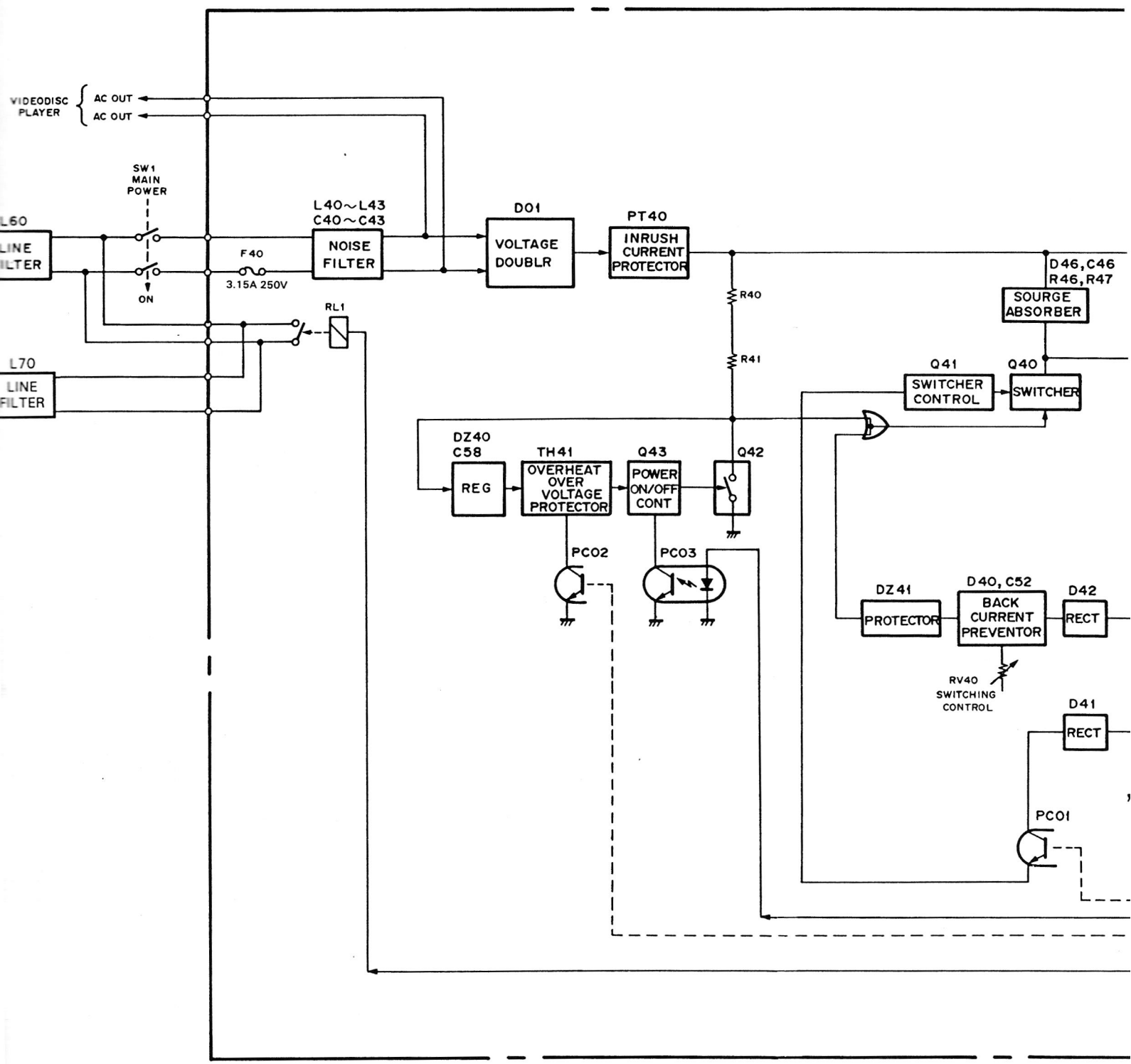

IC113
AT DATA BUFFER
IC109
ADDRESS BUFFER AND MEMORY CONTROLLER
IC104
IC120, 121 IC126, 127
IC116 - 119 IC122 - 125
IC114, 115
IC110
IC111
IC001
DUS-307
IC131
REAL TIME CLOCK
IC132
IC106
D-RAM MODULE (HALF SMI-5050)
CN109
CN108
CN116-1/2
CN116-2/2
TO/FROM CN702/MB-232
TO/FROM CN701/MB-232
SA0 - SA19
SA0 - SA2
SD0 - SD15
MD0 - MD15
LA17 - LA23
RAMADR0 - RAMADR9
ED0 - ED7
X100 16MHz

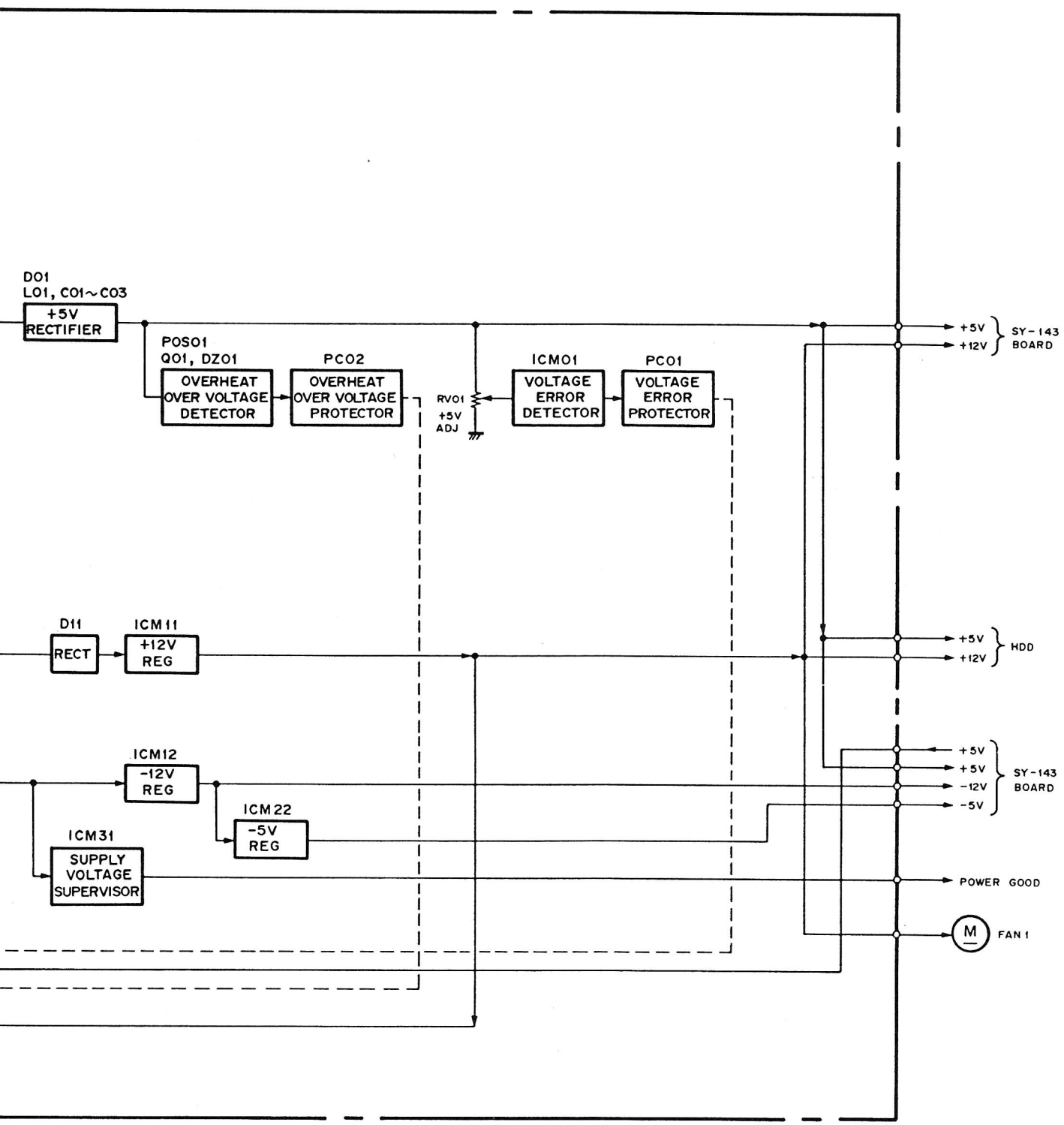

CN109
SA0 - SA5
A1 - A6
TO / FROM CN702 / MB-232
CN108
SA6 - SA19
A12 - A25
TO / FROM CN701 / MB-232
SA0 - SA19
CN108
SD0 - SD7
A2 - A9
TO / FROM CN701 / MB-232
CN109
SD8 - SD15
A17 - A24
TO / FROM CN702 / MB-232
SD0 - SD15
SA0 - SA2
MD0 - MD15
CN116-1/2
MD0-MD7
CN116-2/2
MD8-MD15
IC114, 115
TO / FROM D-RAM MODULE (HALF SM1-5050)
RAMADR0 - RAMADR9
RAMADR0 CN116-1/2
RAMADR9
RAMADR0 CN116-2/2
RAMADR9
IC111
SA1
SA2
CS HD
CSF
FCS
LDCR
LDOR
IC137
OPERATION REGISTER
DATA REGISTER
MASTER STATUS REGISTER
CONTROL REGISTER
HOST INTERFACE
DUAL OSC.
DIGITAL DATA SEPARATOR
CLOCK AND TIMING GENERATOR
8-BIT INTERNAL DATA BUS
ALU
RAM 24 x 8
INSTRUCTION DECODE
PROGRAM COUNTER
ROM 1K x 16
FLAG LOGIC
STATE MACHINE
MS TIMER
DISK INTERFACE CONTROL REGISTER
DATA ENCODER AND DECODER
CRC GENERATOR
WRITE PRECOM-PENSATION
FLOPPY DISK CONTROLLER
CS
LDCR
LDOR
RD
WR
RST
IRQ
DMA
XT1
XT2
RDD
PCVAL
WG
WE
IDX
HD2
DS1
DS2
MO1
DRC
STEP
TR00
WP
HS
DCHNG
RWC/RPM
CN103
X100 16MHz
DB0 - DB7
SD0 - SD7
ED0 - ED7


IC137
FLOPPY DISK CONTROLLER
ALU
RAM 24 x 8
INSTRUCTION DECODE
PROGRAM COUNTER
ROM 1K x 16
FLAG LOGIC
STATE MACHINE
MS TIMER
DISK INTERFACE CONTROL REGISTER
DATA ENCODER AND DECODER
CRC GENERATOR
WRITE PRECOM-PENSATION
8-BIT INTERNAL DATA BUS
CN103
TO/FROM FLOPPY DISK DRIVE
IC133
DUAL UARTS AND PRINTER PORT
UART #1
UART #2
SELECT AND CONTROL LOGIC
PARALLEL POART
CN114
TO/FROM VIDEO DISC PLAYER PART
CN105
RS-232C
(EXT. VIEW)
CN104
PRINTER
IC132
IC112
KBINT
IC128
KEYBOARD INTERFACE
STATUS REGISTER
OUTPUT DATA BUS BUFFER
INPUT DATA BUS BUFFER
PORT 1
PORT 2
EXPANDER INTERFACE
CONTROLLER
INSTRUCTION DECODER
ACCUMU-LATOR
ARITHMETIC LOGIC UNIT (ALU)
TEMPORARY REGISTER
FLAG
TIMING CIRCUIT
CONDITIONAL JUMP LOGIC
8-BIT TIMER / COUNTER
INTERNAL RAM 256x8
DATA MEMORY
REGISTER BANK1
STACK
REGISTER BANK 0
ADDRESS DECODER
PROGRAM MEMORY 2K x 8 (ROM)
11-BIT PROGRAM COUNTER
PROGRAM STATUS WORD
8-BIT INTERNAL BUS
CN106
KEY BOARD
(EXT VIEW)

4-4. SWITCHING REGULATOR




VIDEODISC PLAYER
AC OUT
AC OUT
SW1 MAIN POWER
ON
L60
LINE FILTER
L70
LINE FILTER
F40
3.15A 250V
L40~L43
C40~C43
NOISE FILTER
RL1
D01
VOLTAGE DOUBLR
PT40
INRUSH CURRENT PROTECTOR
R40
R41
D46,C46
R46,R47
SOURGE ABSORBER
Q41
SWITCHER CONTROL
Q40
SWITCHER
DZ40
C58
REG
TH41
OVERHEAT OVER VOLTAGE PROTECTOR
Q43
POWER ON/OFF CONT
Q42
PC02
PC03
DZ41
PROTECTOR
D40, C52
BACK CURRENT PREVENTOR
D42
RECT
RV40
SWITCHING CONTROL
D41
RECT
PC01



SES-P/S EK

SWITCHING REG

1-413-489-11

VIW-5600D (WG)

CHAPTER 6
SELF-DIAGNOSTICS

The self-diagnostic can be performed by means of the system ROM setup program or with the SMW-5001A (VIEW/VGA operating system package) diagnortic program.

6-1. SELF-DIAGNOSTIC PERFORMED WITH THE SETUP PROGRAM

6-1-1. Setup Program In the System ROM

When you first start the system after purchase or after you change the hardware configuration, you must set up the system using the Installation Program included in the SMW-5001A VIEW/VGA Operating System Package.
However, when you want to change the configuration for the keyboard to "not installed," for example when you do not need the keyboard for a VIEW system as the keyboard is not used for demonstration, or when you want to change the CPU clock frequency as the optional board requires, you must use the setup program in the system ROM. The procedure is described below.

1. Turn on the power of the system.

2. When the message "Strike the [F1] key to continue, [F2] to run the setup utility" appears on the screen, press the [F2] key.
   When the MS-DOS has started, press the [Ctrl], [Alt] and [Esc] keys simultaneously.
   The setup program will start.

3. Select the item to be set using the [↓] or [↑] key and then select the setting using the [→] or [←] key.

4. After you have changed the setting, press the [Esc] key.
   The system will restart with the new setting.

Notes:

- In step 3, the following items also appear and they can be changed. However, as they have already been set properly by using the SMW-5001A installation program, do not change their setting

Diskette A:	3.5 inch, 1.44 MB
Diskette B:	Note Installed
Hard disk drive 1:	Type 17 when the SCK-5015 is installed or Not Installed
Hard disk drive 2:	Not Installed
Base memory size:	640 Kbytes
Extended memory size:	Specify the size or Not Installed 2048 Kbytes when the SMI-5050 is installed.
Display	VGA/EGA
Coprocessor	"Not Installed" will be displayed.

- When an item is selected and you press the [F1] key, the explanation for that item will be displayed on the screen.
- You can temporarily change the CPU clock frequency by pressing the [Ctrl] + [Alt] + [↑] or [↓].
- The setup program in the system ROM may not be started when the TSR (Terminate and Stay Resident) program which is started by pressing the [Ctrl], [Alt] or [Esc] is in the memory.

6-1-2. Self-diagnostic Performed with the Setup Program

During or after the power-on process, an error or an informational message may be displayed on the screen. The messages and how to correct the error are as shown below.

6-1-2-1. Setup trouble messages

When one of the following messages is displayed, set the correct configuration information executing the "Set SETUP RAM" of the Installation Program included in SMW-5001A.

Message	Possible Cause	Solution
Diskette configuration error	The specified configuration is not supported	Rerun the SETUP program and change the configuration.
Errors found disk X: Failed initialization	Hard disk configuration information is incorrect.	Rerun the SETUP program and enter correct hard disk information.
Errors found Incorrect configuration information memory size miscompare	The size of base or expansion memory does not agree with configuration information.	Rerun the SETUP program and enter correct memory size.
Hard disk configuration error	The specified configuration is not supported.	Correct the hard disk configuration.
Invalid configuration information — please run SETUP program	• Memory size is incorrect. • Display adapter is configured incorrectly. • Wrong number of diskette drives.	Run the SETUP program.
Time-of-day clock stopped	The Time-of-day clock chip has failed.	Run the SETUP program.
Time-of-day not set — please run SETUP program	Clock not set.	Run the SETUP program.

6-1-2-2. Hardware trouble messages

When one of the following messages is displayed, turn off the unit and turn it on again. If the error message is displayed again, there is hardware trouble.

Message	Possible Cause	Solution
Diskette drive reset failed	The diskette drive has failed	Check the diskette drive.
Diskette drive 0 seek failure	The A: drive has either failed or is missing.	Check the A: drive.
Display adapter failed; using alternate	• The graphic control block failed.	• Check the graphic control block.
Gate A20 failure	Protected mode cannot be enabled.	Check the system control block.
Hard disk failure	Bad disk	Retry boot. If that doesn't work, replace the hard disk.
Hard disk read failure — strike F1 to retry boot	The hard disk is defective.	Retry boot. If that doesn't work, replace the hard disk.
Keyboard clock line failure *	Either the keyboard or the keyboard cable connection is defective.	Make sure the keyboard cable and keyboard are connected properly.
Keyboard data line failure *		
Keyboard controller failure *	The keyboard controller firmware has failed.	Check the keyboard controller.
Keyboard stuck key failure *	A key (s) is jammed.	Try pressing the key (s) again.

Message	Possible Cause	Solution
Memory address line failure at *hex-value*, read *hex-value*, expecting *hex-value*	Circuitry associated with the memory chips has failed.	Check the circuitry.
Memory data line, failure at *hex-value*, read *hex-value*, *hex-value*	One of the memory chips or associated circuitry has failed.	Replace the memory chips.
Memory high address line failure at *hex-value*, read *hex-value*, expecting *hex-value*	Circuitry associated with the memory chips has failed.	Check the circuitry.
Memory double word logic failure at *hex-value*, read *hex-value*, expecting *hex-value*	Memory chip circuitry failed.	Replace the memory chip.
Memory odd/even logic failure at *hex-value*, read *hex-value*, expecting *hex-value*	Circuitry associated with the memory chips has failed.	Check the circuitry.
Memory parity failure at *hex-value*, read *hex-value*, expecting *hex-value*	One of the parity memory chips has failed.	Try replacing the memory chips.
Memory write/read failure at *hex-value*, read *hex-value*, expecting *hex-value*	One of the memory chips has failed.	Try replacing the memory chips.
Not timer tick interrupt	The timer chip has failed.	Check the timer chip on the system board.
Hex-value optional ROM bad checksum=*hex-value*	The peripheral card contains a defective ROM.	Replace the peripheral card.
Shutdown failure	The keyboard controller or its associated logic has failed.	Check the keyboard controller.
Timer chip counter 2 failed	Chip failed.	Check the timer chip system board.
Timer or interrupt controlled bad	Either the timer chip or the interrupt controller is defective.	Check the timer chip or the interrupt controller on the system board.
Unexpected interrupt in protected mode	The non-maskable interrupt (NMI) port can't be disable.	Check the system board, particularly the logic associated with the non-maskable interrupt.

* One of these messages may be displayed when you press a key on the keyboard during the system start-up procedure.

6-1-2-3. Other message

Message	Possible Cause	Solution
Diskette drive 1 seek failure.	The configuration information is incorrect.	Run the SETUP program. At "Diskette B:", select "Not installed".
Diskette read failure strive F1 to retry boot.	The diskette is either not formatted or defective.	Replace the diskette with a bootable diskette and retry boot.
Hard disk controller failure	• Hard disk configuration information is incorrect. • The controller circuitry has failed.	• Rerun the SETUP program and enter correct hard disc information. • Check the circuitry.
No boot device available — strike F1 to retry boot	Either diskette drive A:, the hard disk, or the diskette itself is defective.	Retry boot. If that doesn't work, replace the floppy diskette or the hard disk.
No boot sector on hard disk — strike F1 to retry boot	The C: drive is not formatted or is not bootable.	Format the C: drive, make it bootable.
Not a boot diskette — strike F1 to retry boot	The diskette in drive A: is not formatted as a bootable diskette.	Replace the diskette with a bootable diskette and retry boot.
I/O card parity interrupt at *address*. Type (S) hut off NMI, (R) boot, other keys to continue	The peripheral card has failed.	Type (S) hut off NMI. Note: This will only temporarily allow you to continue. You must replace the peripheral card.
Memory parity interrupt at *address*. Type (S) hut off NMI, (R) boot, other keys to continue	A memory chip (s) has failed.	Type (s) hut off NMI. Note: This will only temporarily allow you to continue. You must replace the memory chip (s).

6-1-2-4. Informational message

The following are the message that provide information and require no action.

- *Hex-value* Base Memory
  Shows the size of the base memory that was tested successfully.

- *Hex-value* Extended Memory
  Shows the size of extended memory that was tested successfully.

- Decreasing available memory
  Displayed immediately after an error message, indicating that the memory chips failed. Refer to the solution for that error message.

- Memory tests terminated by keystroke
  Indicates that you have pressed the spacebar during the memory tests and have stopped the memory tests.

- Strike the F1 key to continue
  Indicates that an error was detected during the self-test diagnostics. Press the F1 key to attempt to boot.

6-2. SELF-DIAGNOSTIC PERFORMED WITH THE SMW-5001A

SMW-5001A includes a diagnostics program which helps check the functions of the VIW-5600D hardware and its peripheral devices. **Run this program whenever you encounter a problem with the** VIW-5600D hardware (including its boards, videodisc player and monitor).
Using this program permits minute checking compared with the system start-up ROM diagnostics or the install program's diagnostics.

Functions of the diagnostics program are divided into three groups as follows:

- **Board level diagnostics**
- **Video/monitor diagnostics**
- **Peripheral diagnostics**

The diagnostics program features the following menu structure:

1. **Board Level Diagnostics**
   - **1.1 System**
     - 1.1.1 One time
     - **1.1.2 Multiple times**
   - **1.2 Display**
     - 1.2.1 One time
     - **1.2.2 Multiple times**
   - **1.3 Extended Memory**
     - 1.3.1 One time
     - **1.3.2 Multiple times**
   - **1.4 Expanded Memory**
     - 1.4.1 One time
     - **1.4.2 Multiple times**

2. Video/Monitor Diagnostics
   - **2.1 Automatic Mode**
   - **2.2 Manual Mode**

3. Peripheral Diagnostics
   - **3.1 Floppydisk Drive Read**
   - **3.2 Harddisk Drive Read**
   - **3.3 Printer**
   - **3.4 Keyboard**
   - **3.5 Mouse/RS-232C**
     - **3.5.1 Using RS-232C (1)**
     - **3.5.2 Using RS-232C (3)**
     - **3.5.3 Using RS-232C (4)**
   - **3.6 Videodisc Player**
   - 3.7 Light Pen

Note:
The devices indicated with an asterisk on the screen during diagnostics are optional equipment. These devices cannot be tested unless they are actually installed.

6-2-1. Getting Started with the Diagnostics Program

1. **Start up MS-DOS**
   Insert the SMW-5001A VIEW/VGA Operating System **Package's backup disk into the floppydisk drive and turn on the power. MS-DOS boots from the floppydisk.**

When the installation program is started, select "Exit to MS-DOS".

2. When the MS-DOS prompt (A>) is displayed, remove the backup disk and insert the Supplemental Programs Disk.

3. Type "DIAG" and press Enter to start the diagnostics program.

The following main menu will be displayed:

```
VIW-5000/5600D
Diagnostics Program Version x.xx (c) 1990 by Sony Corporation

1.  Board Level Diagnostics
2.  Video/Monitor Diagnostics
3.  Peripheral Diagnostics

Select a menu using [NUMBER] and [ENTER] keys.
[ESC] key: To selection screen.
>_
```

To quit diagnostics program
Press Esc in the main menu displayed at the above step 3. The system will be restarted.

If an error message is displayed and the system does not start
The system ROM diagnostics program has probably detected a hardware problem. Refer to the VIW-5600D's operating instructions

Notes

- **Once the diagnostics program is started, ending the program always restarts the system. There is no way to quit the session without restarting the system.**
- **To execute the diagnostic item 1.4 "Expanded Memory", the MM.SYS EMS device driver must be installed in your CONFIG.SYS. For details on the CONFIG.SYS file and device driver, refer to Chapter 3 of the SMW-5001A instruction manual.**
- **Diagnostics-related files other than the 'DIAG.COM file are hidden. These files cannot be displayed on the screen using MS-DOS's "DIR" command.**

6-2-2. Board Level Diagnostics

Items tested in the board level diagnostics are as follows:

System
- CPU 80286
- Timer, interrupt controller
- Printer interface
- RS-232C chip
- Address gate A20
- Shutdown function
- Harddisk controller
- Main memory

Display
- Video RAM
- Color register
- Palette RAM
- Transparent color
- I/O addresses

Extended memory
Whether the memory area increased by the optional SMI-5050 Memory Expansion can be used as "extended" memory.

Expanded memory
Whether the memory area increased by the optional SMI-5050 Memory Expansion can be used as "expanded" memory.

Notes
- Disconnect the equipment connected to the VIW-5000's RS-232C connector before you perform the system board diagnostics.
- During the display board diagnostics, the screen may flicker. This is a part of the test procedure and is not a system malfunction.
- The diagnostics program tests the extended memory and expanded memory only for the sizes specified by in SETUP RAM.

6-2-2-1. Operation
1. Type "1" (for "Board Level Diagnostics") at the main menu and press Enter.

2. Type the sub-digit of the menu item and press Enter. For example, type "1" to test the system board and press Enter.

   Type "1" to test only once or "2" to repeat the test. Then press Enter.

3. The multiple times diagnostics has 10-second intervals between each test. When the "C" key is pressed during the interval, the next test starts immediately regardless of the time elapsed since the previous test.
   To stop the test, press Esc.

   The test starts. Test items are displayed on the screen.
   When the test has been successfully completed, "OK" appears for each item.
   If an error is detected, "NG" is displayed. In that case, exit from this diagnostics program and turn off the power. Then start the diagnostics program and repeat the test. If the same error persists, contact your authorized Sony representative for assistance.

4. Press Esc to return to the submenu (1.1 screen).

Note
Press Esc to return to the pervious higher menu level in the hierarchy structure. For example, if Esc is pressed at the menu 1-1, the menu 1 (1. Board Level Diagnostics) reappears.

6-2-3. Video/Monitor Diagnostics

Items tested in the video/monitor diagnostics are as follows:

Display mode

In the Automatic mode, screens are displayed one by one.
In the Manual mode, you can test the display mode according to the screen instructions using the following keys:

[N] [P] keys	Next/Previous screen
[G] key	Sets Genlock mode (automatic or internal).
[S] key	Sets superimposing mode (computer graphics only, superimpose, or video image only).
[T] key	Sets transparent color mode (single or multiple transparent color).
[↑] [↓] [←] [→] and Enter keys	Select a color palette using the cursor keys, and press [Enter] to set/remove it as the transparent color. Pressing [Enter] acts as a toggle switch to turn on/off the transparent color.
[Esc] key	Ends the test.

Note

Select a video image using the "3-6 Videodisc Player" menu for superimposing with the computer graphics.

6-2-4. Peripheral Diagnostics

Tests performed in the peripheral diagnostics are as follows:

Floppydisk drive read

Performs the read test. You will be asked to replace the backup disk with another disk for this test. When the test is completed, be sure to reinstall the backup disk in the floppydisk drive.

Harddisk drive read

Performs the read test.

Printer

Tests the printer by printing alphanumeric characters.

Keyboard

Displays the characters associated with each key on the keyboard. Press a key and see whether the corresponding character is displayed.

Mouse/RS-232C

Tests the mouse (SMI-3062) and RS-232C interface when the mouse is connected to the VIW-5000's RS-232C connector. To check the COM ports (RS-232C) 3 and 4, use the SMI-3031 Dual RS-232C Board.

Videodisc player

Tests the videodisc player performance. Refer to the Remote controller commands.

Light Pen

Tests the optional SMI-5061 Light Pen and SMI-3086 Light Pen Interface board.

Note

Errors detected during the floppydisk drive read test may be attributable to damage on the floppydisk being used. To determine the cause of the error, repeat the test using another floppydisk.

6-2-4-1. Operation

Type "3" (for "Peripheral Diagnostics") at the main menu and press [Enter].
The following submenu will be displayed.

1. Type the sub-digit of the menu item and press [Enter]. For example, type "5" to test the mouse/RS-232C and press [Enter].

2. Enter the item number and press [Enter].

Follow the instructions on the screen for the rest of the operation.

3. Press [Esc] to quit the test.

Note

To quit the keyboard diagnostics, press [Esc] followed by [Enter].

6-2-5. Remote Controller Commands

In the simulated remote controller, the following keys may be used to control the videodisc player.

Key	Functions
C	Clears videodisc player status.
H	Switches audio channels 1 and 2. (CH-1, CH-2)=(ON, ON) → (ON, OFF) → (OFF, ON) → (OFF, OFF) → (ON, ON)...
I	Switches index on/off.
M	Changes access mode. Frame number mode ↔ Chapter number mode
R	Performs repeat play from current frame to specified frame with specified times or within a specified chapter.
S	Performs frame or chapter search for the specified number.
Enter	For repeat play operation, sets the frame number, chapter number and repeat count. For search operation, sets the frame number and chapter number.
Space	Performs still.
F1/F2	Performs reverse/forward scan.
F3/F4	Performs reverse/forward fast play.
F5/F6	Performs reverse/forward step and still.
F7/F8	Performs reverse/forward play.
Up/Down Arrow key	Changes current mode. — (PLAY) — (STILL/STEP) — (FAST) — (SCAN) —
Left/Right Arrow key	Reverse/forward with current mode.
Esc	Turns commander on/off.
Ctrl+Up/Down Ctrl+Left/Right	Moves commander's position.
Q	Ends process.

When you select a certain command using the corresponding key (such as "S" for search and "R" for repeat play), an appropriate dialogue will appear on the screen for you to specify various values including a frame number and chapter.

How to quit

To quit this program, press the "Q" key. The system returns to the menu 3-6.

6-3. SELF-DIAGNOSTIC PERFORMED WITH THE INITIALIZATION

The following subsection discusses ROM initialization procedures. An explanation of POST tests and diagnostics follows. The boot message facilities are then discussed.

6-3-1. Power-On Self Tests

Power-on self tests (POST) are the system test and component initialization processes performed by AT-Compatible ROM. POST begins when system power is applied. It is followed by a system boot load, which loads an operating system into RAM. The self test and initialization functions of POST are tightly interwoven. The most central hardware is tested and initialized first.

Proper functioning of the central hardware is required before further system tests can be run.

6-3-2. System Board Failure

In general, a failure in a test of critical system-board circuitry or components resuits in sounding a beep code (if used) and in a halted system.

The Beep Codes for fatal and non-fatal system board errors are listed separately on the following page.

6-3-2-1. Fatal System Board Errors

Note: No beep code is sounded if a test is aborted while in progress. The contents of port 80h can be read to identify the area of failure.

Beep Code	Contents Port 80h	Description
none	01h	CPU register test in progress
1-1-3	02h	CMOS write/read failure
1-1-4	03h	ROM BIOS checksum failure
1-2-1	04h	Programmable interval timer failure
1-2-2	05h	DMA initialization failure
1-2-3	06h	DMA page register write/read failure
1-3-1	08h	RAM refresh verification failure
none	09h	First 64K RAM test in progress
1-3-3	0Ah	First 64K RAM chip or data line failure multi-bit
1-3-4	0Bh	First 64K RAM odd/even logic failure
1-4-1	0Ch	Address line failure first 64K RAM
1-4-2	0Dh	Parity failure first 64K RAM
2-1-1	10h	Bit 0 first 64K RAM failure
2-1-2	11h	Bit 1 first 64K RAM failure
2-1-3	12h	Bit 2 first 64K RAM failure
2-1-4	13h	Bit 3 first 64K RAM failure
2-2-1	14h	Bit 4 first 64K RAM failure
2-2-2	15h	Bit 5 first 64K RAM failure
2-2-3	16h	Bit 6 first 64K RAM failure
2-2-4	17h	Bit 7 first 64K RAM failure
2-3-1	18h	Bit 8 first 64K RAM failure
2-3-2	19h	Bit 9 first 64K RAM failure
2-3-3	1Ah	Bit A first 64K RAM failure
2-3-4	1Bh	Bit B first 64K RAM failure
2-4-1	1Ch	Bit C first 64K RAM failure
2-4-2	1Dh	Bit D first 64K RAM failure
2-4-3	1Eh	Bit E first 64K RAM failure

6-3-2-2. Fatal System Board Errors, cont'd

Beep Code	Contents Port 80h	Description
2-4-4	1Fh	Bit F first 64K RAM failure
3-1-1	20h	Slave DMA register failure
3-1-2	21h	Master DMA register failure
3-1-3	22h	Master interrupt mask register failure
3-1-4	23h	Slave interrupt mask register failure
none	25h	Interrupt vector loading in progress
3-2-4	27h	Keyboard controller test failure
none	28h	CMOS power failure and checksum calculation in progress
none	29h	CMOS configuration vaildation in progress
3-3-4	2Bh	Screen initialization failure
3-4-1	2Ch	Screen retrace test failure
3-4-2	2Dh	Search for video ROM in progress
none	2Eh	Screen running with video ROM
none	30h	Screen operable
none	30h	Screen runnig with video ROM
none	31h	Monochrome monitor operable
none	32h	Color monitor (40 column) operable
none	33h	Color monitor (80 column) operable

6-3-2-3. Non-Fatal System Board Errors

A failure in add-on boards or memory is reported on the monitor. These error-messages help isolate the failed subsystem.

The following table describes the beep codes and error codes that are written to Port 80h for non-fatal system board errors.

Message	Meaning
Hex-value Base Memory	The amount of base memory that tested successfully.
Hex-value Expanded Memory	The amount of expanded memory that tested successfully.
Hex-value Extra Memory	The amount of extra memory that tested successfully.
Hex-value Standard Memory	The amount of standard memory that tested successfully.
Decreasing available memory	This message immediately follows any memory error message. Informing you that failed memory chips means you have less memory available.
Memory Tests terminated by keystroke	You have pressed the spacebar while memory tests were runnig, stopping the memory tests.
Strike the F1 key to continue	An error was found during POST. Pressing the F1 key allows the system to boot.

CHAPTER 8
ADJUSTMENT

There is a LDP-3600D type videodisc player mounted on the computer block. Disconnect it as explained in Chapter 2 before adjustment.

8-1. TOOLS LIST

In general, adjustment of this unit requires the following equipments:

1. Monitor (PCD-1402E etc.) and Monitor cable
2. SMW-5001A (MS-DOS)
3. Accessories floppydisk
4. Frequency counter
5. Oscilloscope (refer to section 8-2-3)
6. Color-bar signal generator for PAL and NTSC (refer to section 8-2-4)
7. VS-42 extension board: P/N J-6082-093-A
8. VS-42 extension cable: P/N J-6082-092-A
9. DC regulated power supply
10. Screwdrivers for adjustment
11. Soldering iron and solder

8-2. PREPARATION

8-2-1. Connectors for Performing Adjustments without Connecting the Videodisc Player Section

1. Connection for turning the power on
   Apply a +5V voltage to Pin ⑧ of CN114 on the SY-143 board through a 1 k Ω resister.

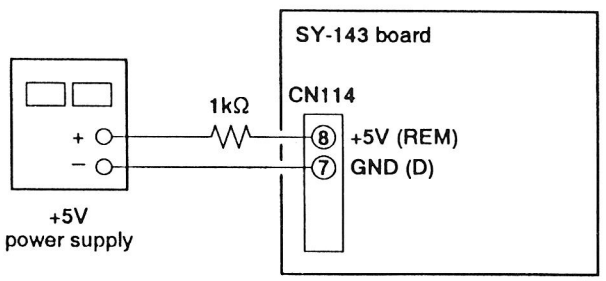


Fig. 8-1.

2. Connection required to input the video signal

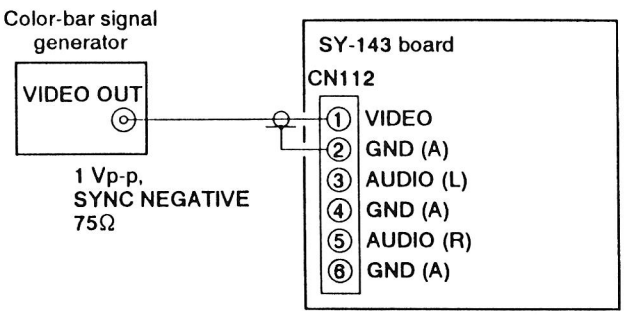


Fig. 8-2.

8-2-2. Setting the VS-42 Board Upright

The VS-42 board must be set upright in order to perform adjustments.

1. Unplug the following two connectors and detach the VS-42 board from the SY-143 board.
   1. CN401 (VS-42 board)
   2. CN402 (VS-42 board)
2. Connect CN115 (SY-143 board) to CN-402 (VS-42 board) with the VS-42 extension board (J-6082-093-A).
3. Connect CN113 (SY-143 board) to CN401 (VS-42 board) with the VS-42 extension cable (J-6082-092-A).

8-2-3. About Oscilloscope

An oscilloscope capable of following three or more waveforms (or two, if it has an external trigger input terminal) and provided with a TV sync (field, line) separator is required for adjustment of the computer block.

- Band width limit
  This function restraints high-frequency conponents to make the waveform easier to observe. However, adjustment is also possible without this function.
- TV-LINE and TV-FLD
  Shows the TV sync separator trigger mode.

8-2-4. About Video Signal

Standard color-bar signals (NTSC, PAL, setup 0%, white level 100% and 75%, 1 Vp-p) is used as the video signal for the adjustment.
75% and 100% white level color-bars an required for both NTSC and PAL system. EIA NTSC color-bar is applicable.
While adjusting the computer block, must always give this signal to the computer block.

8-2-5. Initial Setting

- VS-42 board
  SL402 ····· Short by the solder
  SL401 ····· Open
  SL403 ····· Open (short-circuited only when both CN401 and CN403 of VS-42 board are disconnected.)
- SY-143 board
  SW301 ····· 3 side (at right, seen from the rear)
  TP201 ····· 0 side (33 CH to 33 FH side)

8-3. RUN SYSTEM

Operation 1: Power on, the minitor.
Also, the oscilloscope and signal generator.

Operation 2: Insert system disk (SMW-5001A) of MS-DOS in drive A and power on the computer block.

Operation 3: When the main menu appears on the monitor, select "Exit to MS-DOS".

Operation 4: At the "A>" prompt, type in the following to start the diagnostic program.
CD/DIAG [ENTER]
DIAG [ENTER]

Operation 5: Select the diagnostic program 2.2.2 Video/Monitor diagnostic manual mode.

Operation 6: Set modes as follows:
Display mode: 12
Genlock mode: Automatic
Superimpose mode: Superimpose

8-4. VS-42 BOARD

8-4-1. H AFC Adjustment (NTSC)

Confirmation 1:	Applied the solder on the pattern jumper SL401 (Pin ③ of IC405 – GND)
Measuring equipment:	Oscilloscope
Vertical mode:	CHOP
Trigger channel:	ch-2
Trigger slope:	Up edge
Trigger coupling:	AC
Measuring point ch-1:	TP403 (coupling: DC)

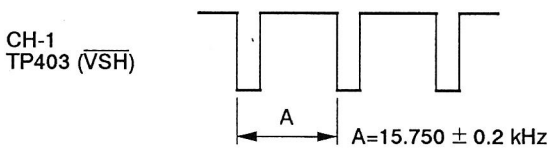


Fig. 8-3. TP403

Specification:	T=63.5 ± 0.5 μ sec
Adjustment:	RV405 Adjust the RV405 so that waveform of ch-1 drifts slowest.

Note: Set oscilloscope to 2V/DIV and 20 μ sec/DIV.

Operation 1:	Power off, the computer
Operation 2:	Remove the solder from the pattern jumper SL401.
Operation 3:	Power on, the computer.
Operation 4:	Run system (refer to section 8-3)
Confirmation 2:	Monitor screen and waveform of ch-1 are stable.

8-4-2. APC Adjustment (NTSC)

Operation 1:	Power off, the computer
Operation 2:	Remove the solder from the pattern jumper SL402.
Operation 3:	Power on, the computer
Operation 4:	Run system (refer to section 8-3)
Measuring equipment:	Monitor

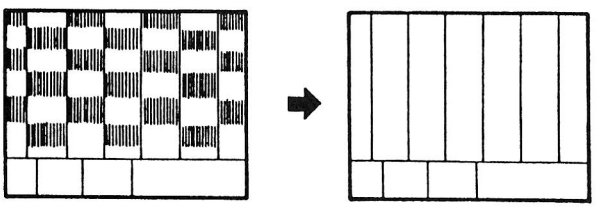


Fig.8-4. Monitor screen

Specification:	Color-sync is stable. See Fig. 8-4.
Adjustment:	RV409
Operation 5:	Power off, the computer
Operation 6:	Apply the solder on the pattern jumper SL402.
Operation 7:	Power on, the computer
Operation 8:	Run system (refer to section 8-3)
Confirmation:	Color-sync is stable. See Fig. 8-4.

8-4-3. Output RGB Top Level Adjustment (NTSC)

(EIA color-bar or NTSC color-bar with 100% white is used for the video input.)

Measuring equipment:	Oscilloscope
Vertical mode:	ALT
Trigger channel:	ch-3
Trigger slope:	Up edge
Trigger coupling:	AC
Measuring point ch-1:	TP406 (coupling: DC)
Measuring point ch-2:	TP405 (coupling: DC)
Measuring point ch-3:	TP403
Operation:	Overap GND-level of ch-1 and ch-2 on the oscilloscope screen.

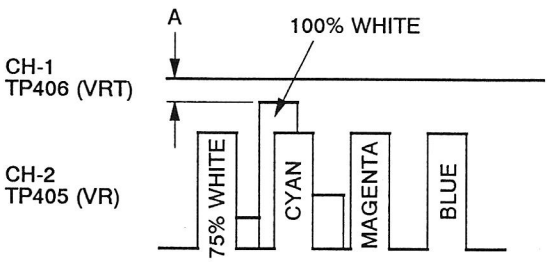


Fig. 8-6. TP405, TP406

Specification:	A = 40 ± 10 mV
Adjustment:	RV401

Note: Set oscilloscope to 50 mV/DIV and 20 μ sec/DIV.

8-4-4. Output RGB Bottom Level Adjustment (NTSC)

Operation 1:	Key operation 1: INT10EX [RETURN]
Operation 2:	Key operation 2: VGADIAG (Use a utility disk) [RETURN]
Operation 3:	Key operation 3: 3 [RETURN]
Operation 4:	Key operaton 4: [↓] (Video FADE 0%)
Operation 5:	After the adjustment, repeat section 8-4-3.

Adjust the waveform of the signal when the signal level becomes maximum.

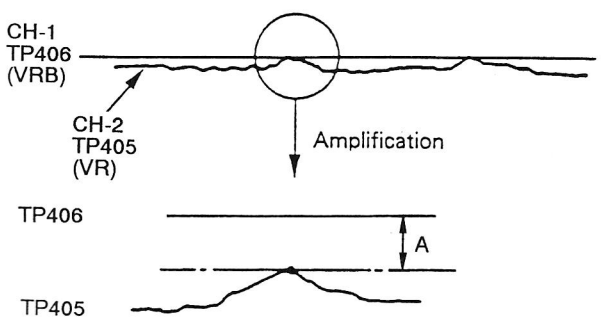


Fig. 8-7

Meauring equipment:	Oscilloscope
Vertical Mode:	ALT
Trigger channel:	ch-3
Trigger slope:	Up edge
Trigger coupling:	AC
Measuring point ch-1:	TP407 (coupling: DC)
Measuring point ch-2:	TP405 (coupling: DC)
Measuring point ch-3:	TP403
Operation:	Overlap: GND-level of ch-1 and ch-2 on the oscilloscope screen.
Specification:	A = 10^{+20}_{-10} mV
Adjustment:	RV411

8-4-5. Burst Flag Position Adjustment

Measuring equipment:	Oscilloscope
Vertical mode:	ALT
Trigger channel:	ch-2
Trigger slope:	Up edge
Trigger coupling:	AC
Measuring point ch-1:	TP402 (coupling: AC)
Measuring point ch-2:	TP404 (coupling: AC)

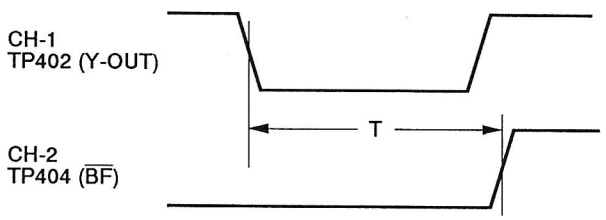


Fig. 8-8. TP402. 404

Specification:	T = 5.6 ± 0.1 μ sec
Adjustment:	RV408

Note: Set oscilloscope to 1 μ sec/DIV, 0.1 mV/DIV at ch-1, and 5 V/DIV at ch-2.

8-4-6. Hue and Color Adjustment (NTSC)

(NTSC color-bar with 75% white or EIA color-bar is used for the video input.)

Measuring equipment: Oscilloscope
Vertical mode: ch-1
Trigger channel: ch-2
Trigger slope: Up edge
Trigger coupling: TV-LINE
Measuring point ch-1: TP405 (coupling: AC)
Measuring point ch-2: TP403 (coupling: AC)
Adjust with RV406 so that blue level becomes to the cursor 1 and the white level to the cursor 2.
And adjust with RV410 so that the cyan and magenta levels become linear.

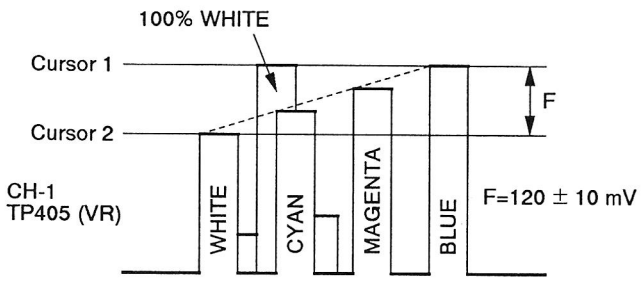


Fig. 8-9. TP405

Specification: Refer to Fig. 8-9.
Adjustment: RV406, RV410 (alternately adjust)
Note: Set oscilloscope to 0.2 V/DIV and 20 μ sec/DIV.

8-4-7. Video Horizontal Position Adjustment (NTSC)

Operation 1: Feed the monoscope signal to the video in.
Operation 2: Adjust with RV403 so that the center of the monoscope video signal becomes to the center of the centercross.
Operation 3: Confirm the horizontal resolution of the monoscope is more than 270 TV screen lines.
Measuring equipment: Monitor

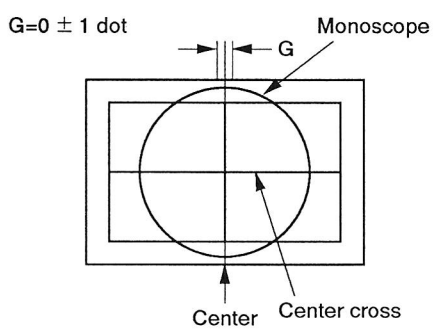


Fig. 8-10

8-4-8. H AFC Adjustment (PAL)

Confirmation 1: Applied the solder on the pattern jumper SL401 (Pin ③ of IC405 – GND)
Measuring equipment: Oscilloscope
Vertical mode: CHOP
Trigger channel: ch-2
Trigger slope: Up edge
Trigger coupling: AC
Measuring point ch-1: TP403 (coupling: DC)

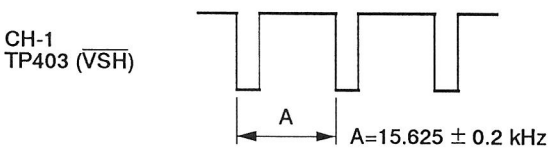


Fig. 8-11. TP403

Specification: T = 64.0 ± 0.5 μ sec
Adjustment: CV401
Adjust the CV401 so that waveform of ch-1 drifts slowest.
Note: Set oscilloscope to 2 V/DIV and 20 μ sec/DIV.

Operation 1: Power off, the computer
Operation 2: Remove the solder from the pattern jumper SL401.
Operation 3: Power on, the computer.
Operation 4: Run system (refer to section section 8-3)
Confirmation 2: Monitor screen and waveform of ch-1 are stable.

8-4-9. APC Adjustment (PAL)

Operation 1: Power off, the computer
Operation 2: Remove the solder from the pattern jumper SL402.
Operation 3: Power on, the computer
Operation 4: Run system (refer to section 8-3)
Measuring equipment: Monitor

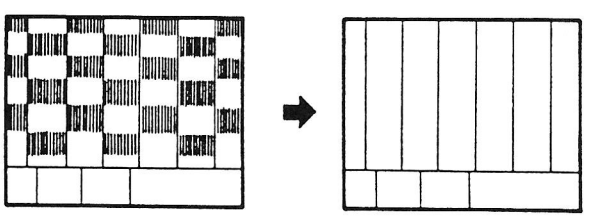


Fig. 8-12. Monitor screen

Specification: Color-sync is stable. See Fig. 8-12.
Adjustment: CV402
Operation 5: Power off, the computer
Operation 6: Apply the solder on the pattern jumper SL402.
Operation 7: Power on, the computer
Operation 8: Run system (refer to section 8-3)

8-4-10. Output RGB Level Adjustment (PAL)

(PAL color-bar with 100% white is used for the video input.)

Measuring equipment: Oscilloscope
Vertical mode: ALT
Trigger channel: ch-3
Trigger slope: Up edge
Trigger coupling: AC
Measuring point ch-1: TP406 (coupling: DC)
Measuring point ch-2: TP405 (coupling: DC)
Measuring point ch-3: TP403
Operation: Overap GND-level of ch-1 and ch-2 on the oscilloscope screen.

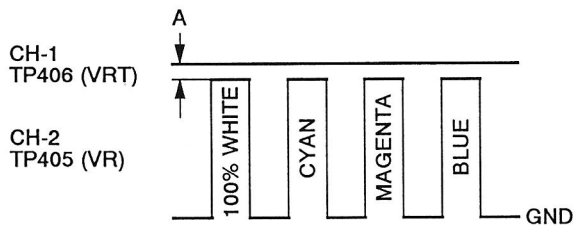


Fig. 8-13. TP406, TP405

Specification: A = 40 ± 10 mV
Adjustment: RV402
Note: Set oscilloscope to 50 mV/DIV and 20 μ sec/DIV.

8-4-11. Hue and Color Adjustment (PAL)

(PAL Color-bar with 75% white is used for video input.)

Mesureing equipment: Oscilloscope
Vertical mode: ch-1
Trigger channel: ch-2
Trigger slope: Up edge
Trigger coupling: TV-LINE
Measuring point ch-1: TP405 (coupling: AC)
Measuring point ch-2: TP403 (coupling: AC)
Adjust with RV407 so that the blue level becomes to the cursor 1 and the white level to the cursor 2.
And adjust with LV401 so that the cyan and magenta levels become linear.

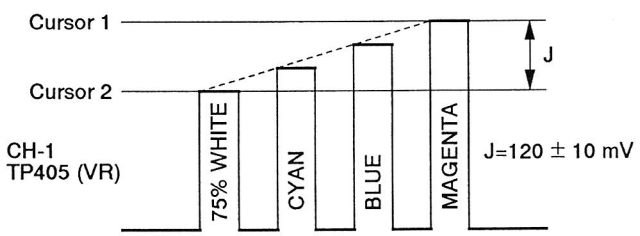


Fig. 8-14. TP405

Specification: Refer to Fig. 8-14.
Adjustment: RV407, LV401 (alternately adjust)
Note: Set oscilloscope to 0.2 V/DIV and 20 μ sec/DIV.

8-4-12. Video Horizontal Position Adjustment (PAL)

Operation 1: Feed the monoscope signal to the video in.
Operation 2: Adjust with RV404 so that the center of the monoscope video signal becomes to the center of the centercross.
Operation 3: Confirm the horizontal resolution of the monoscope signal is more than 340 TV screen lines.
Measuring equipment: Monitor

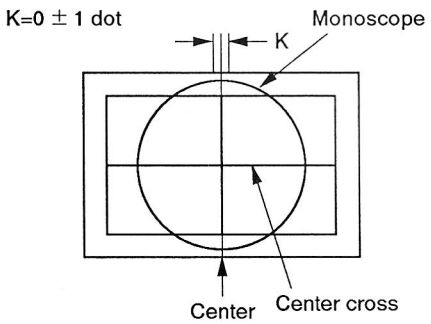


Fig. 8-15. Monitor screen

8-5. SY-143 BOARD

8-5-1. P RAM Latch Timing Adjustment

Measuring equipment: Oscilloscope
Vertical mode: CHOP
Trigger channel: ch-2
Trigger source: Up edge
Trigger coupling: DC
Measuring point ch-1: TP206 (coupling: DC)
Measuring point ch-2: TP202 (coupling: DC)
Operation: Match the middle level of channels 1 and 2, so that A = B and C = D.

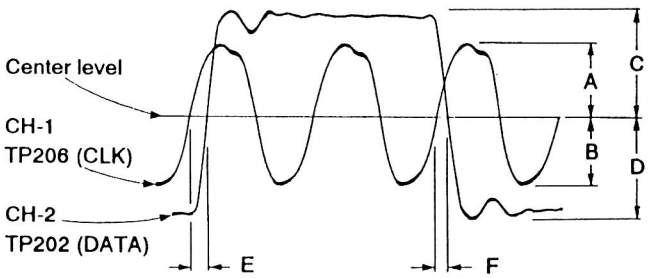


Fig. 8-16. TP206, TP202

Spaecification: E = 0^{+5}_{-8} nsec
F = 0^{+5}_{-8} nsec
Adjustment: JP202
Set the JP202 jumper to the position that minimizes E and F.

Note: Set oscilloscope to 10 nsec/DIV, 1V/DIV at ch-1, 1V/DIV at ch-2.

8-5-2. VCO Adjustment

Confirmation: Confirm that the superimpose mode is set (refer to section 8-3).
Measuring equipment: Oscilloscope
Vertical mode: ch-1
Trigger channel: ch-1
Trigger slope: Up edge
Trigger coupling: AC
Measuring point ch-1: TP201 (coupling: DC)

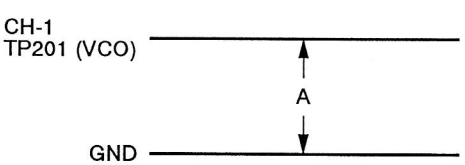


Fig. 8-17. TP201

Specification: A = 3.0 ± 0.1 V
Adjustment: L307

8-5-3. Setting in After Adjustment

- VS-42 board
  SL402 ·····Short by the solder
  SL401 ·····Open
  SL403 ·····Open
- SY-143 board
  SW301 ·····3 side (at right, seen from the rear)
  TP201 ·····0 side (33CH to 33FH side)

[VIDEODISC PLAYER SECTION INFORMATION]

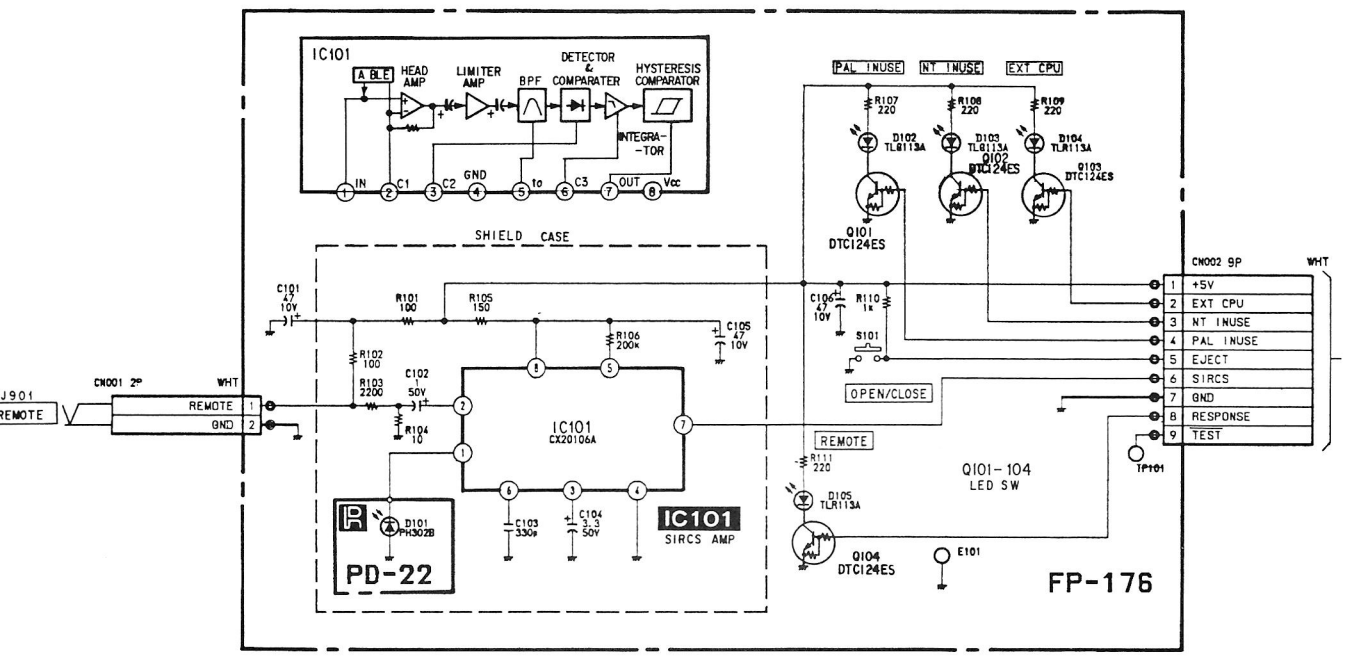
The videodisc player section of VIW-5600D is about the same as LDP-3600D.
This chapter describes the difference between the videodisc player section of VIW-5600D and LDP-3600D.
For repair, please refer to LDP-3600D Service Mannual (LDP-3300P/3600D: 9-972-783-21) about the information not contained in this mannal.

1. FP-176 BOARD

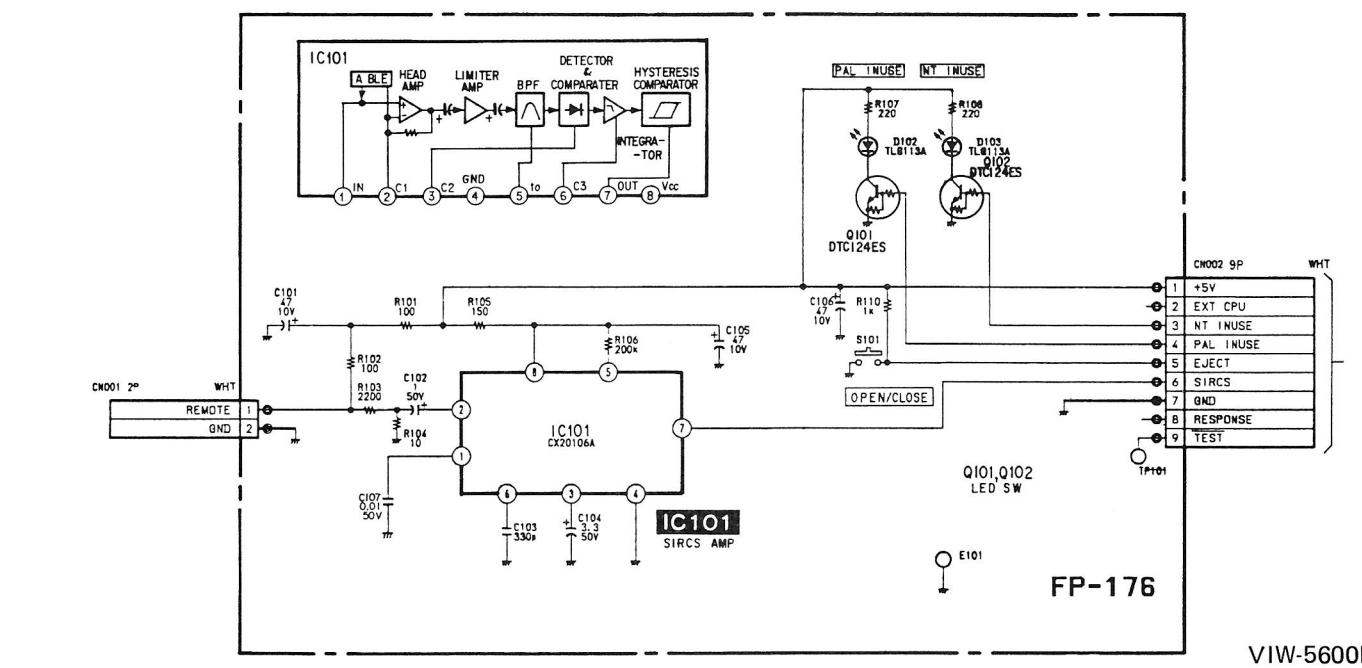
DELETION: D104, D105, J901, Q103, Q104, R109, R111, PD-22 board, shield case.
ADDITION: C107 Mylar 0.01 μF/50 V (1-161-379-00)

1-1. SCHEMATIC DIAGRAM

LDP-3600D (page 72)



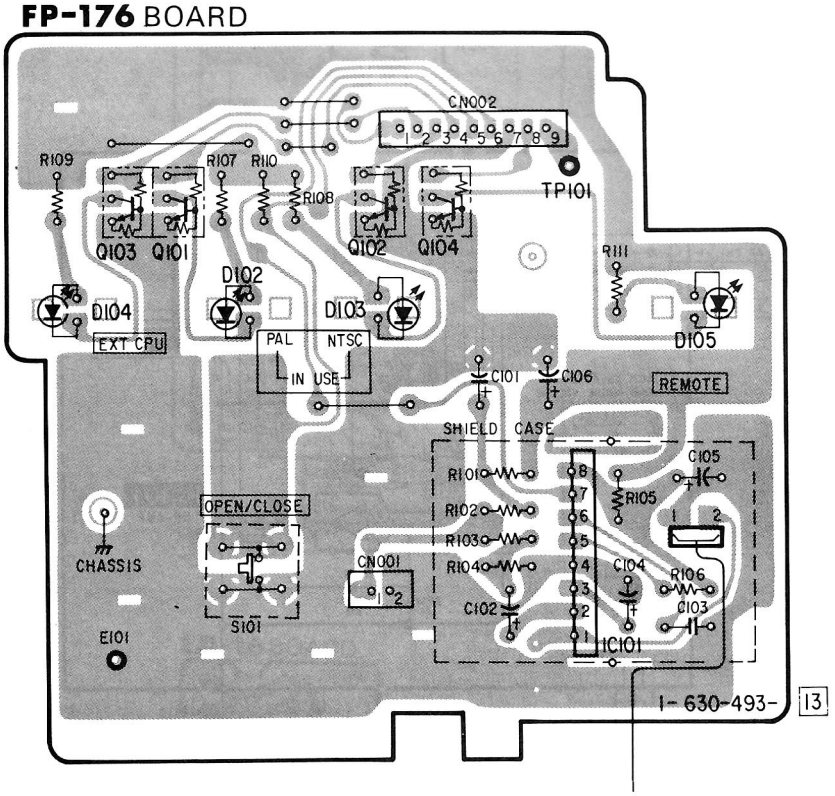
VIW-5600D



VIW-5600D (WG)

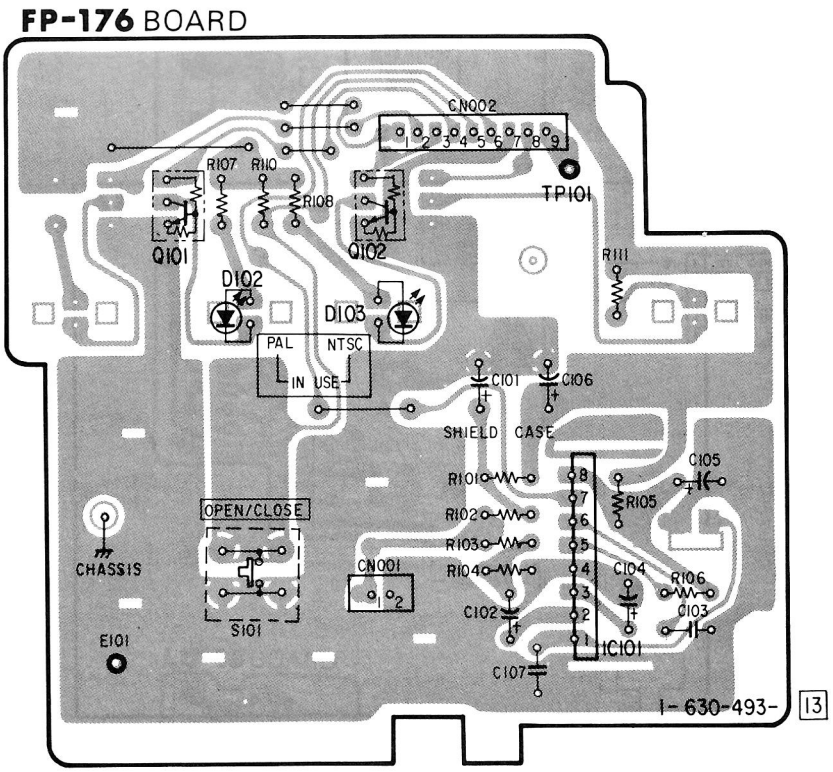
1-2. PRINTED WIRNG BOARDS
LDP-3600D (page 75)

FP-176 BOARD



VIW-5600D

FP-176 BOARD

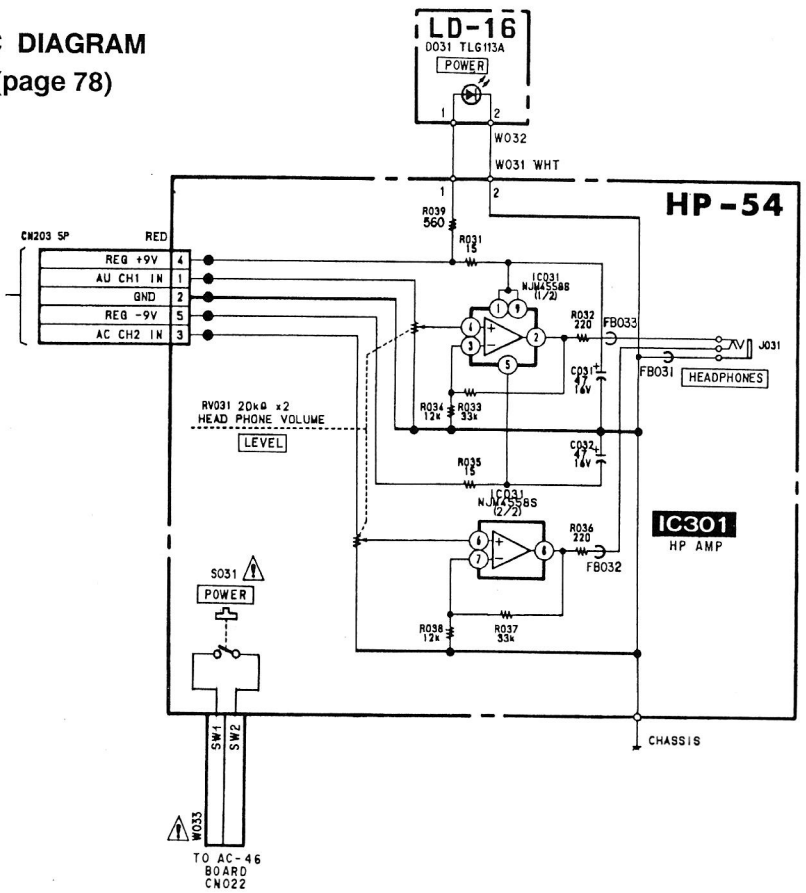


2. HP-54 BOARD

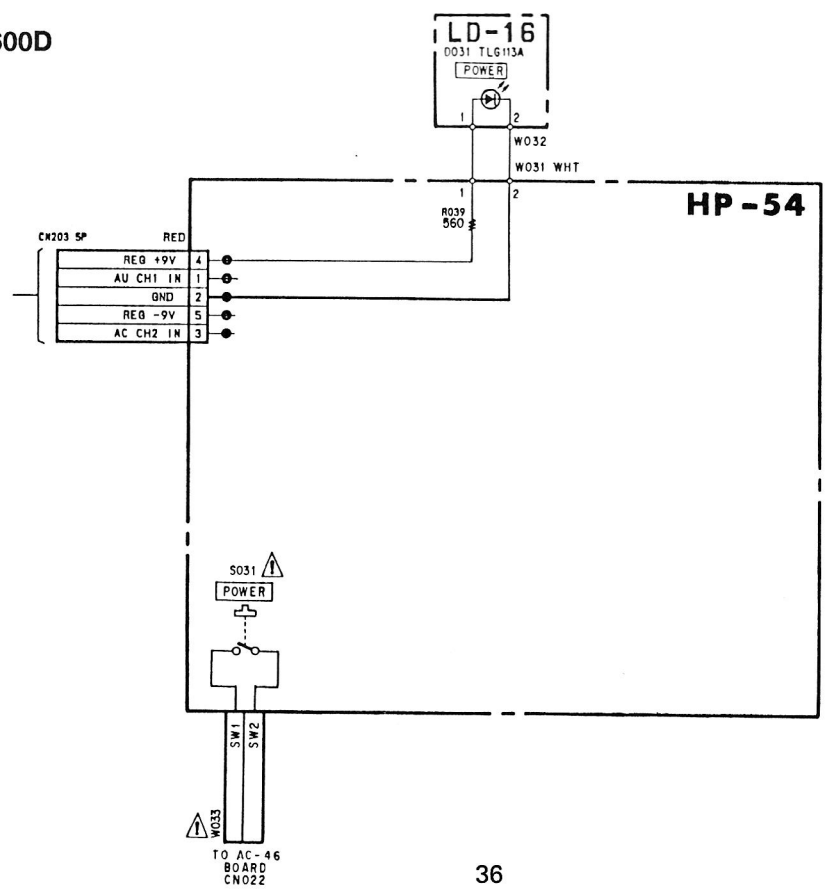
DELETION: CO31, CO32, FB301, FB302, FB303, IC301, J301, R031 – R038, RV031

2-1. SCHEMATIC DIAGRAM

LDP-3600D (page 78)

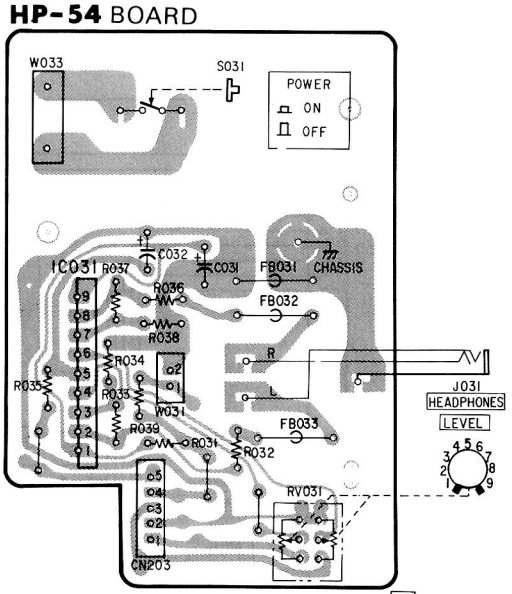


VIW-5600D

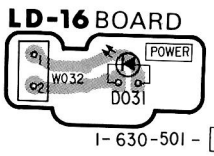


2-2. PRINTED WIRING BOARD
LDP-3600D (page 80)

HP-54 BOARD

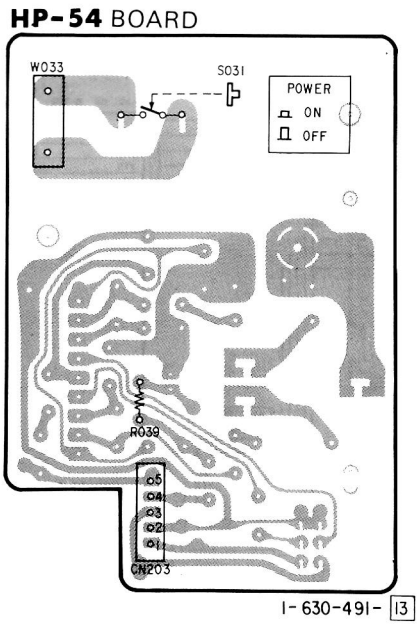


LD-16 BOARD

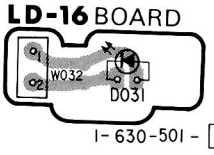


VIW-5600D

HP-54 BOARD



LD-16 BOARD



3. CP-25 BOARD

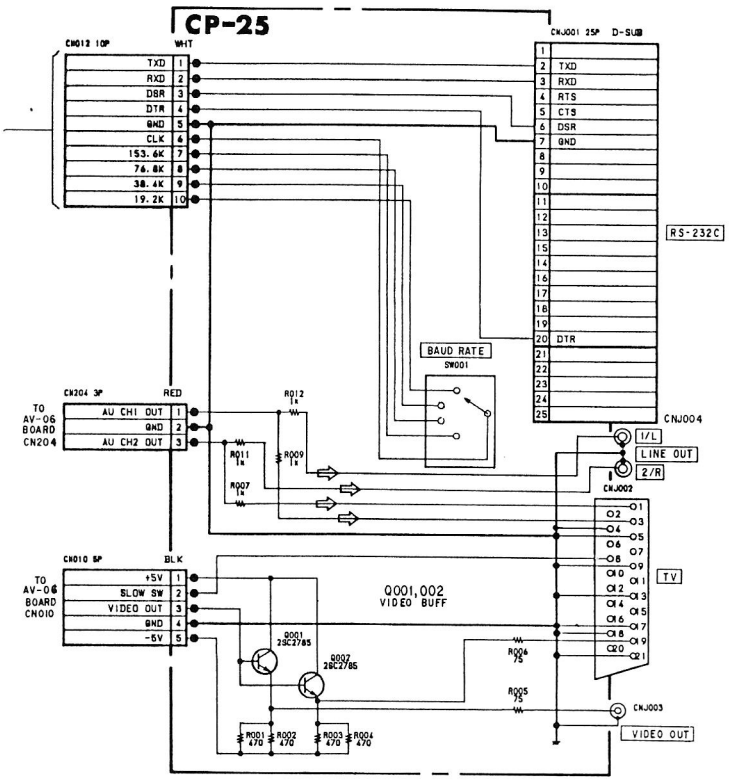
DELETION: CNJ001 – CNJ004, Q002, R003, R004, R006, R007, R009

ADDITION: R015 CARBON 470 Ω 1/4 W (1-249-413-11)

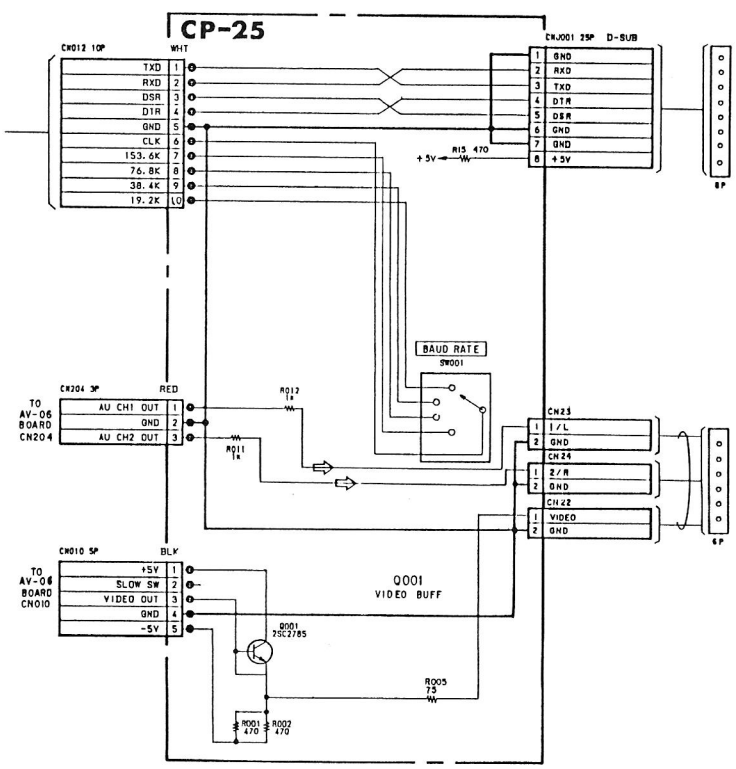
HARNESS CX-01, CX-02

3-1. SCHEMATIC DIAGRAM

LDP-3600D (page 72)

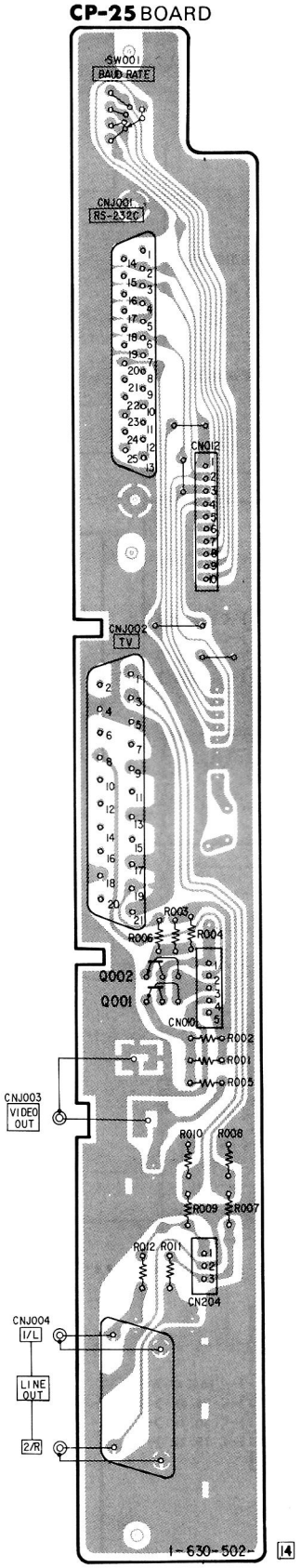


VIW-5600D



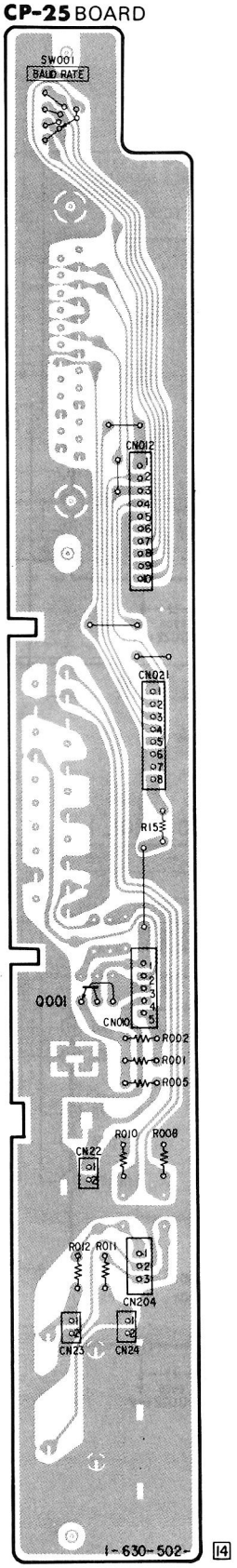
3-2. PRINTED WIRING BOARD
LDP-3600D (page 73)

CP-25 BOARD



VIW-5600D

CP-25 BOARD



4. SS-91 BOARD

DELETION: C906 – C908, IC906, R904 – R907

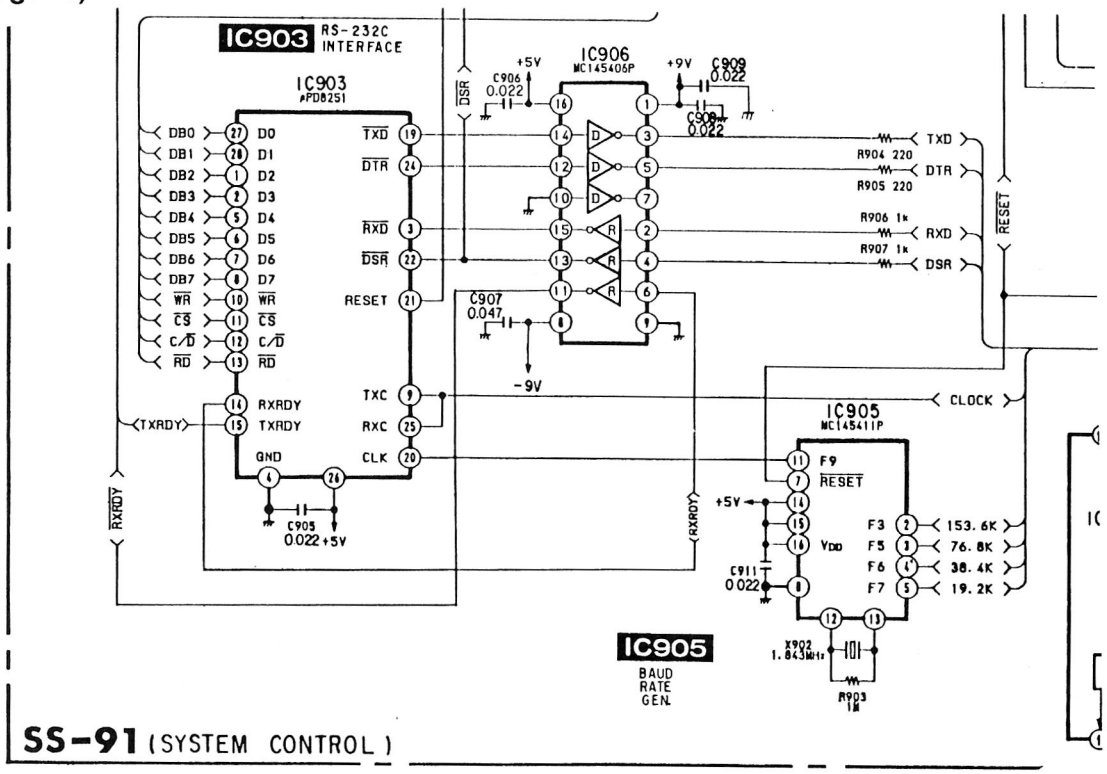
ADDITION: R900 CARBON 22k Ω 1/4 W (1-249-433-11)

JUMPER WIRES

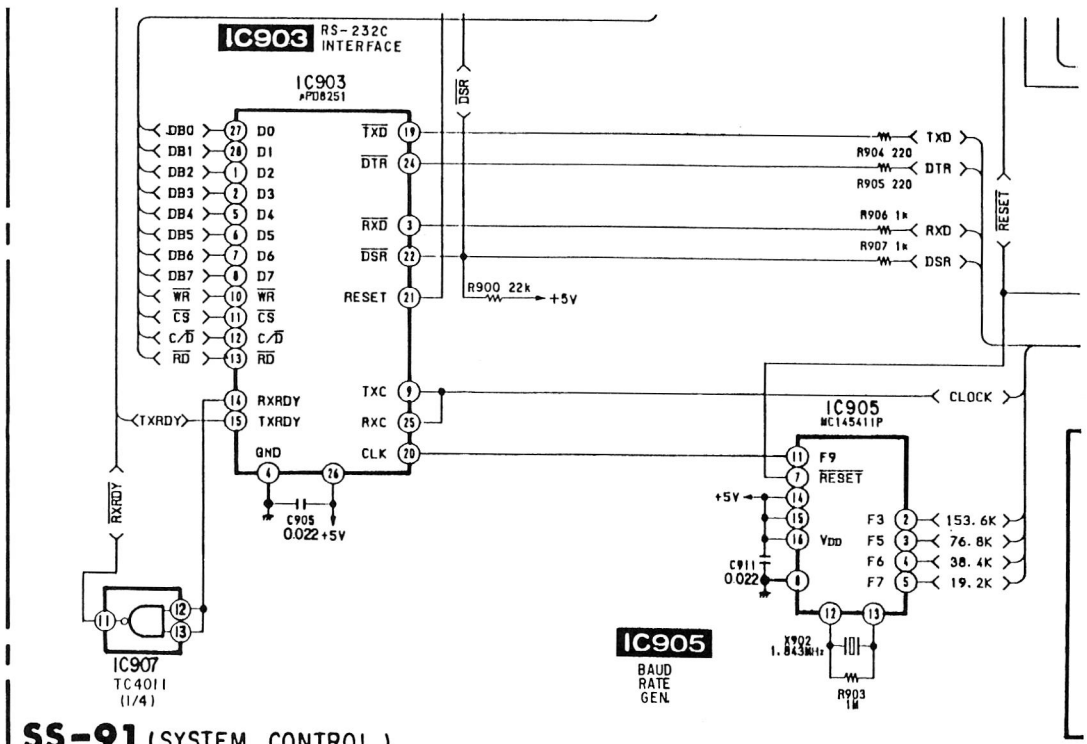
4-1. SCHEMATIC DIAGRAM

LDP-3600D

(page 70)

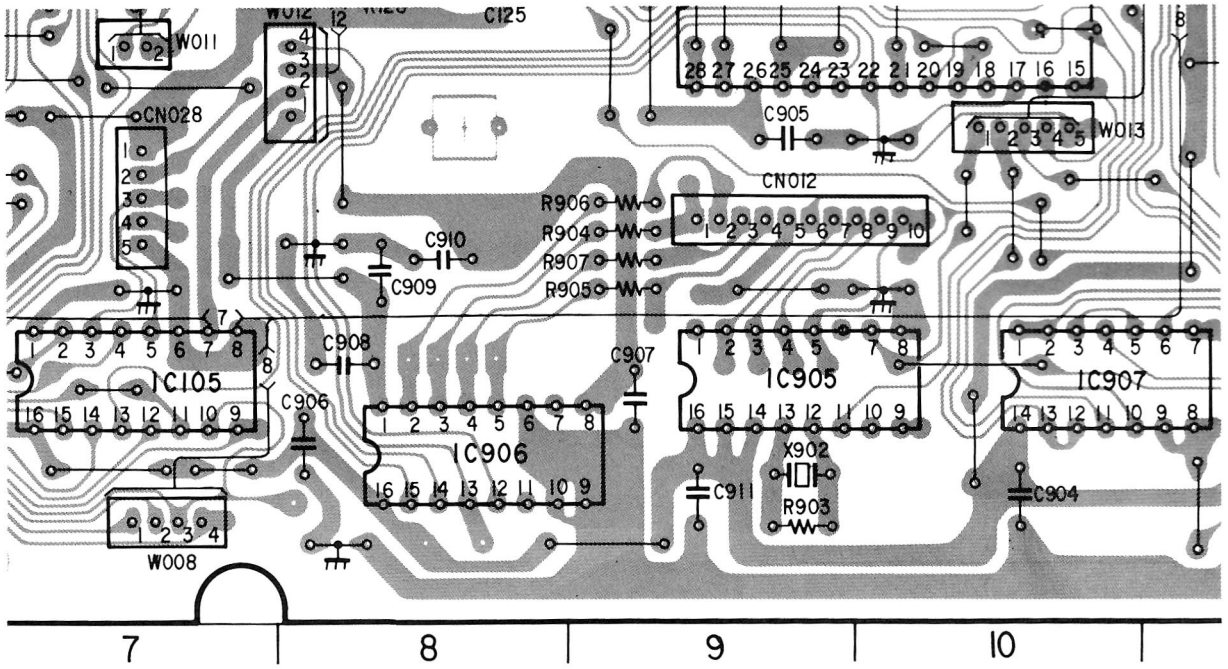


VIW-5600D

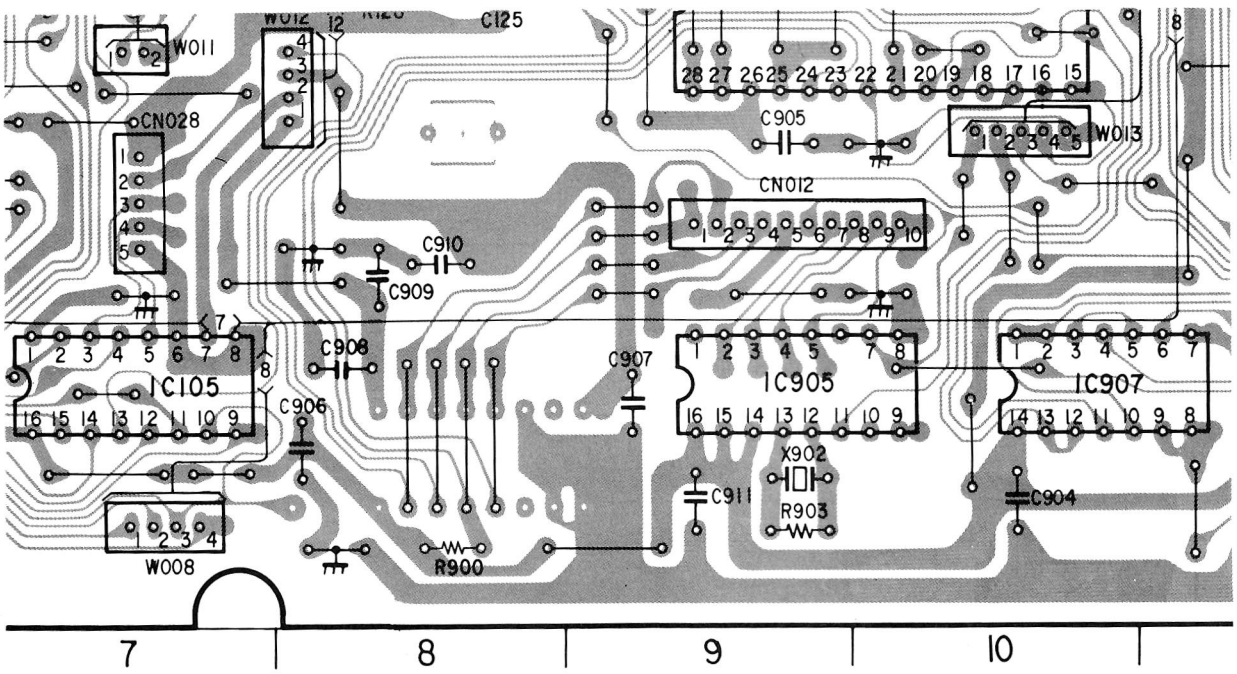


VIW-5600D (WG)

4-2. PRINTED WIRING BOARD
LDP-3600D (page 74)



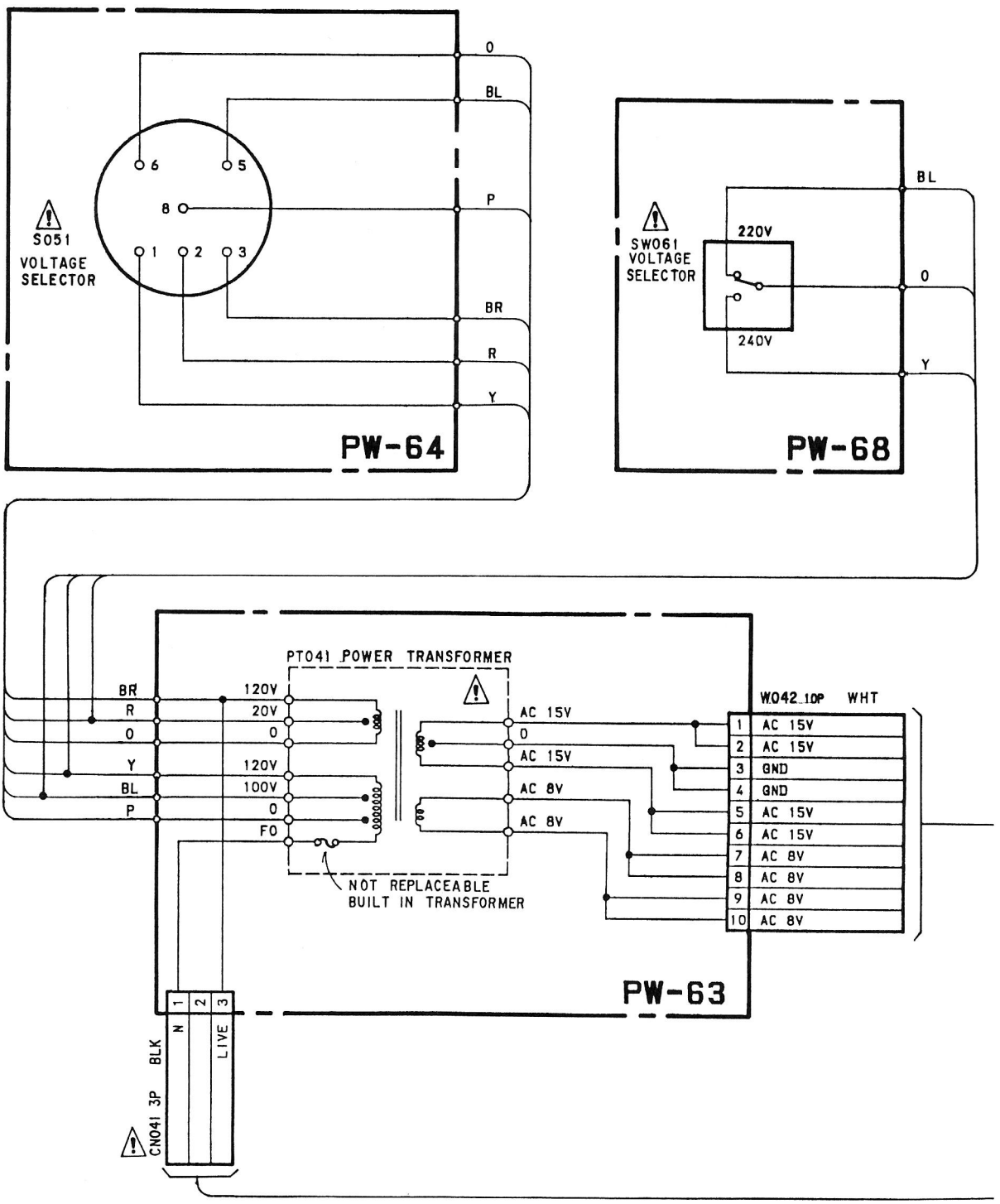
VIW-5600D



5. POWER SUPPLY BLOCK

The power transformer is changed.
LDP-3600D: 1-449-667-12
VIW-5600D: 1-449-667-21

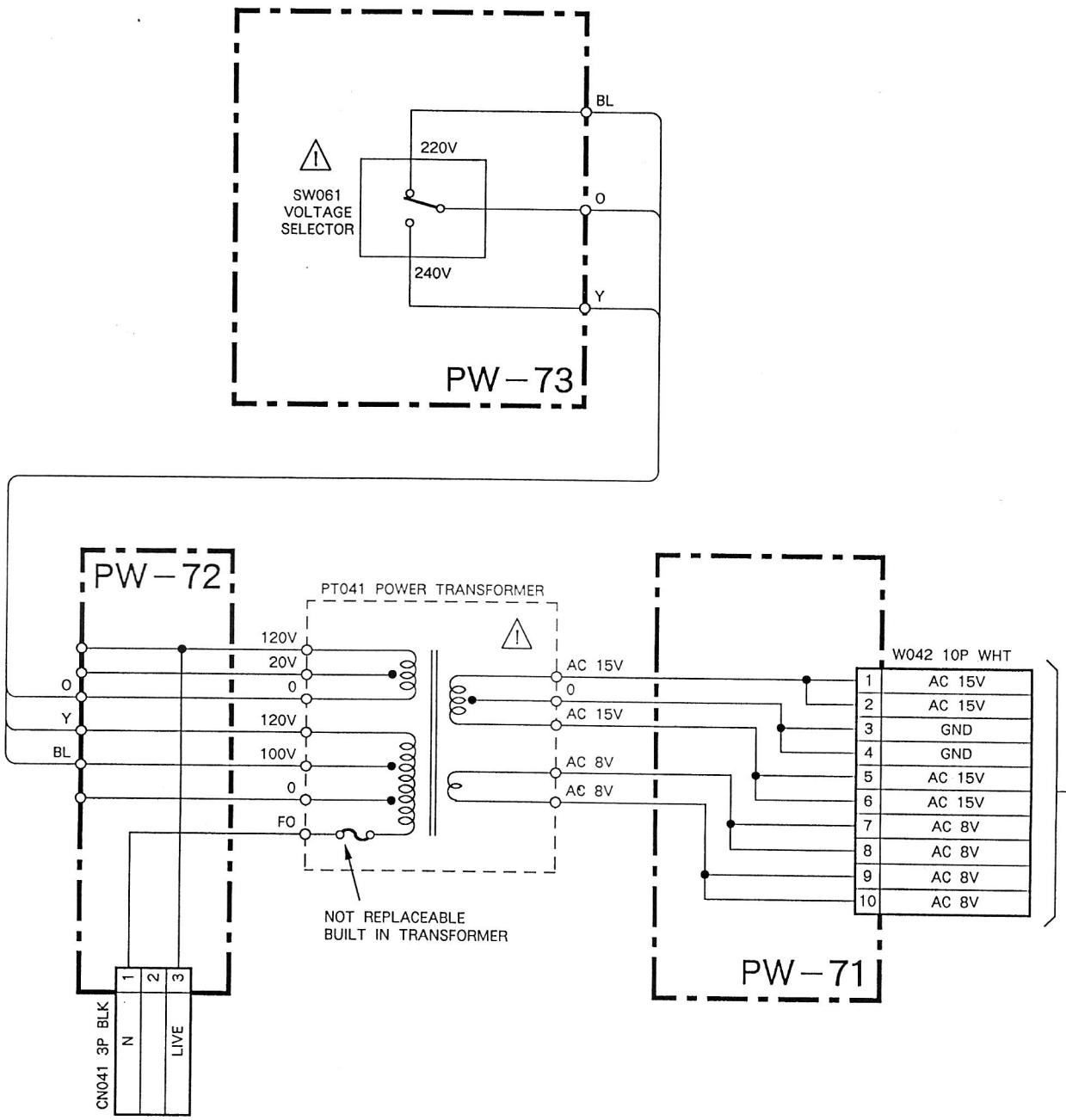
5-1. SCHEMATIC DIAGRAM
LDP-3600D (page 83)



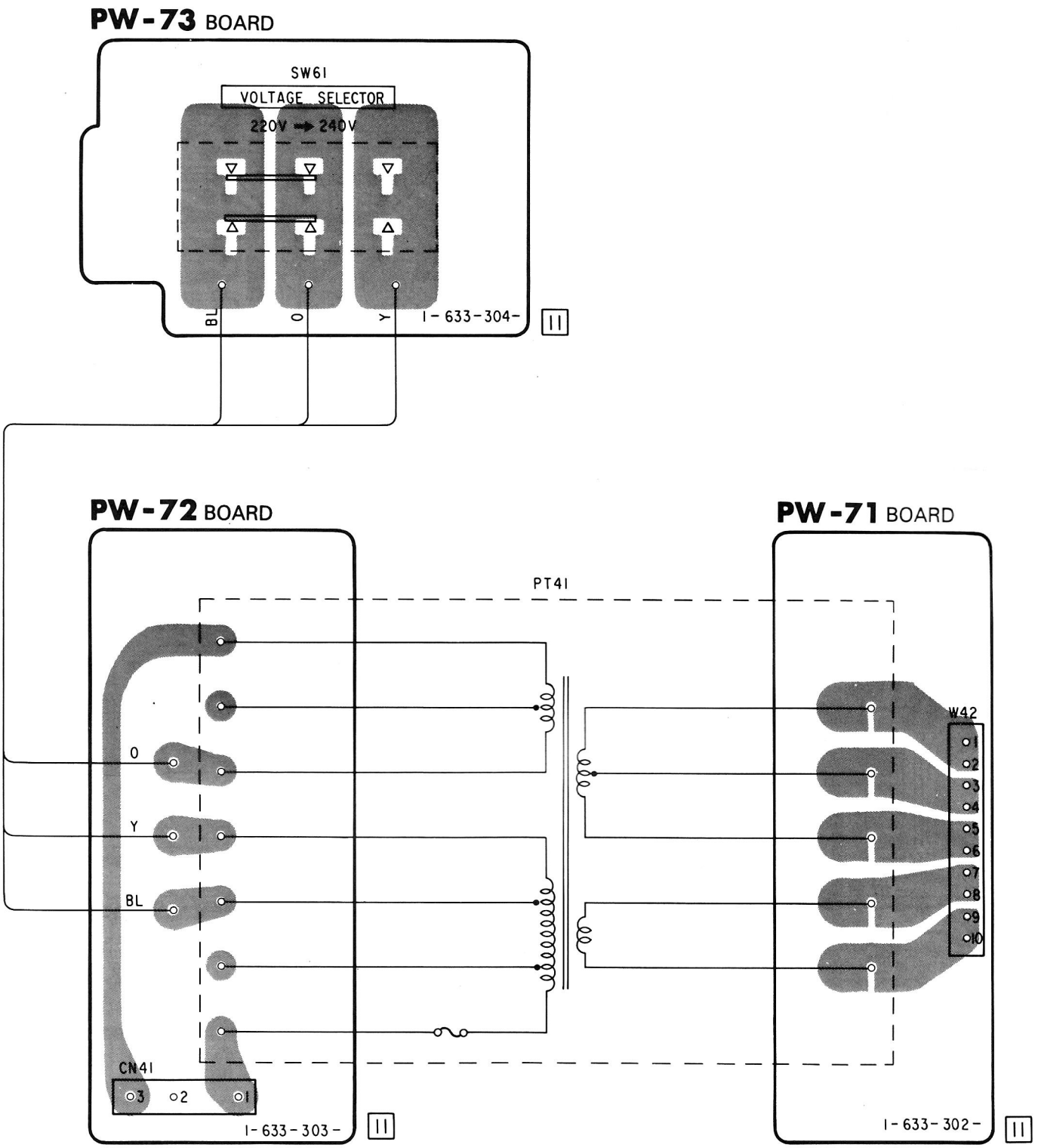
VIW-5600D

Part No.	Description
★1-633-302-11	PW-71 BOARD
★1-633-303-11	PW-72 BOARD
★1-633-304-11	PW-73 BOARD

- Items marked "★" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.



5-2. PRINTED WIRING BOARDS
VIW-5600D



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